AUGUST 10, 1953

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

Freight Absorption When . . . Where?

That old question is returning to plague steel producers, cheer users —p. 53

✓ **THE 1954 AUTO MODELS**
What They'll Be Like, p. 67

✓ **HIGH SPEED NONFERROUS TUBING**
Light Gages to 120 fpm, p. 146

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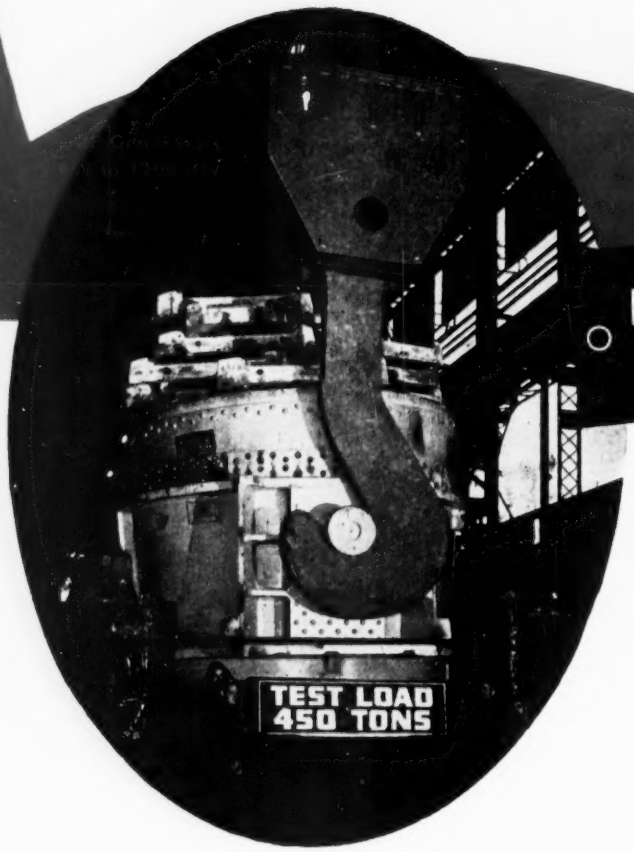
SAFE CRANE CONTROL



WRIGHT DYNAMIC LOWERING CIRCUIT for D-c Crane-Hoists

New dynamic lowering circuits for D-c crane-hoists come and go—are superseded by other new circuits, but the well-known EC&M Wright Dynamic Lowering Circuit Hoist Controller continues to be first choice for industrial cranes.

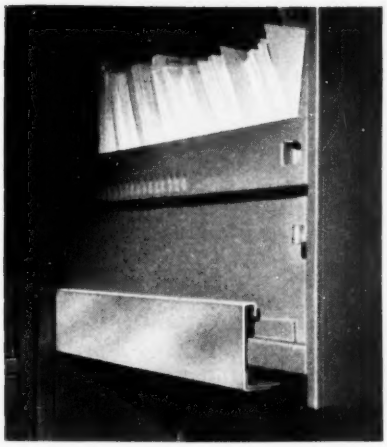
Quick brake-release and fast-operating LINE-ARC Contactors permit accurate spotting of heavy loads—resulting in fewer inching movements, which maintenance men recognize as a contributing factor to reduced upkeep.

Also important is that the operator has direct control (from the Master Switch) of all loads in the lowering direction. The EC&M Wright Circuit is SAFE.

WHEN BUYING CRANES IT PAYS TO SPECIFY E C & M CONTROL

THE ELECTRIC CONTROLLER & MFG. CO.

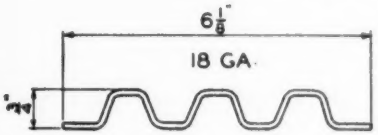
2698 EAST 79TH STREET • CLEVELAND 4, OHIO



ONE OF THESE

MAYARI R SHAPES

MAY GIVE YOU AN IDEA



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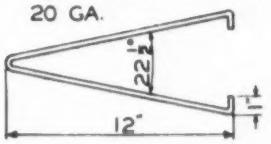

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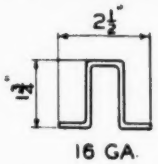

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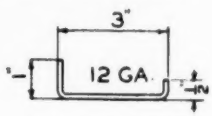

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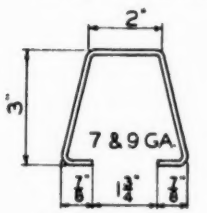

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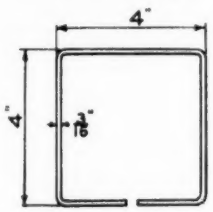

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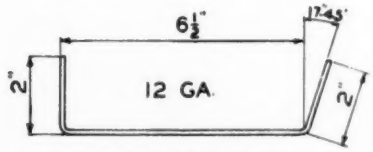

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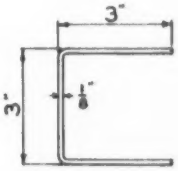
There are dozens of product applications for Mayari R cold-formed shapes . . . metal furniture . . . refrigerators . . . door tracks . . . storage racks . . . hand rails . . . curtain tracks . . . conveyor systems . . . and many others that will occur to you when you study these drawings.

These shapes are formed or rolled to the exact dimensions you require, without any waste material. They are easy to cut and assemble. And they can be welded by the usual methods used for carbon steel.

Mayari R, our low-alloy, high-strength steel, has a yield point of 50,000 psi minimum, almost twice that of plain carbon steel. This means that lighter gages can be used to reduce deadweight without sacrificing strength. Mayari R also has from 5 to 6 times as much resistance to atmospheric corrosion as plain carbon steel, and 2 to 4 times that of copper-bearing steel.

Consider these made-to-order sections with the thought of improving the design of your products, reducing deadweight, or cutting production costs. We'll be glad to help you work out a shape that will meet your needs. Get in touch with any Bethlehem sales office, or write to us at Bethlehem, Pa.

BETHLEHEM STEEL



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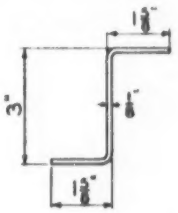

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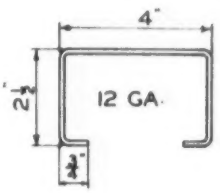

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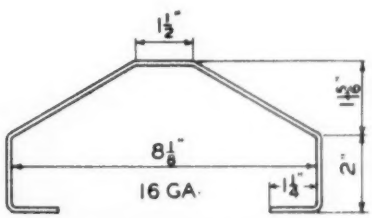

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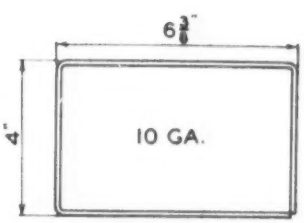
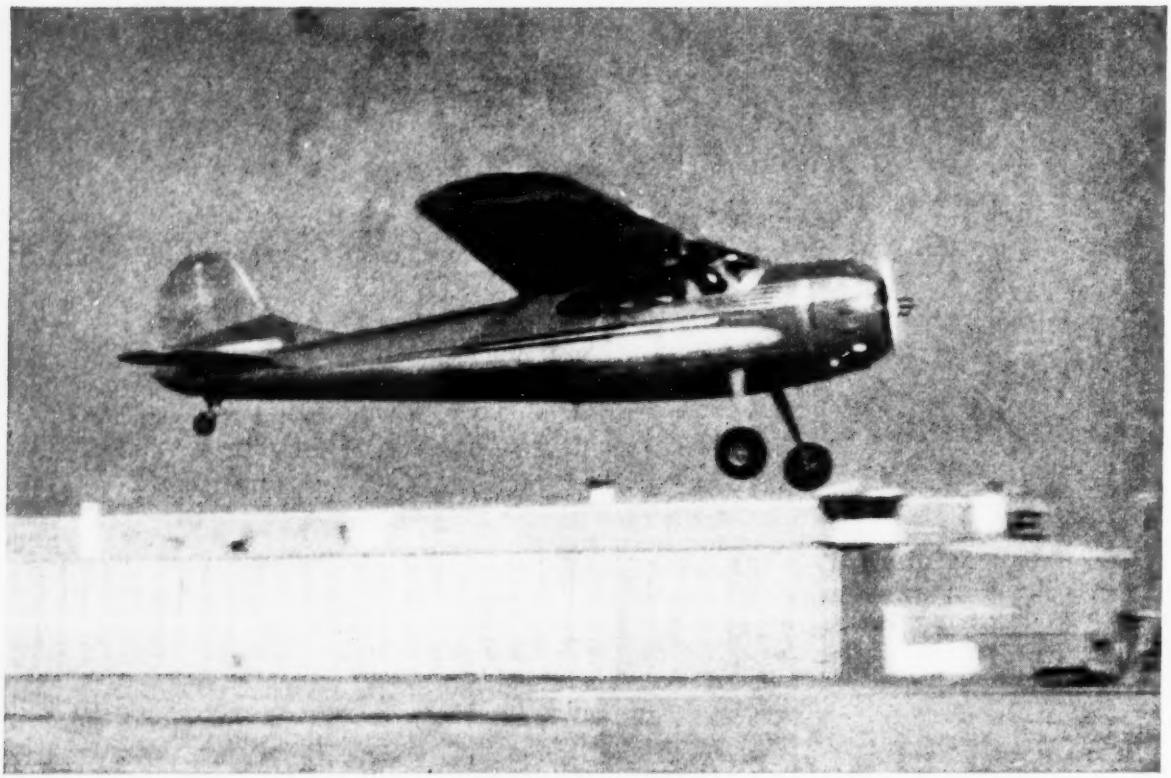


LENGTH 7'-9"

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

Mayari R *makes it lighter... stronger... longer lasting*



OFFICE IN THE SKY for businessmen in a hurry is this handsome 5-place *Businessliner* executive plane built by Cessna Aircraft Company, Wichita, Kansas.

Executive suite for men on the way up

Getting where they want to go on time saves money for executives flying Cessna's popular *Businessliner.*

It's powered by a rugged 300-hp engine made by Barium's Jacobs Aircraft Engine Company, Pottstown, Pa., a 25-year veteran in the airplane business. Jacobs also turns out precision gears and hydraulic assemblies for jet fighters, and is working on a radically new convertiplane (winged helicopter) slated to reach a top speed of 185-190 mph.

3.2A

Assignments like these more than justify the emphasis which Jacobs, like all Barium companies, places on top-flight engineering. For Barium believes you've got to have good design if you want good products.

Creative engineering is never in short supply at Barium, for its engineering resources are as varied as its products. Like to have this notable engineering talent focused on *your* problem? Write Barium Steel Corporation, 25 Broad St., New York 4, N. Y.

BAYONNE BOLT CORP. • CENTRAL IRON AND STEEL COMPANY • CHESTER BLAST FURNACE, INC. • CLYDE IRON WORKS, INC. • CUYAHOGA SPRING COMPANY • EAST COAST AERONAUTICS, INC. • ERIE BOLT AND NUT COMPANY • GEOMETRIC STAMPING CO. • GLOBE FORGE INCORPORATED • INDUSTRIAL FORGE & STEEL, INC. • JACOBS AIRCRAFT ENGINE CO. • KERMATH MANUFACTURING CO. • KERMATH LIMITED (CANADA) • PHOENIX BRIDGE CO. • PHOENIX IRON & STEEL CO. WILEY MANUFACTURING CO.

DOWN THE SUSQUEHANNA en route to James McWilliams Blue Line, Inc., N. Y., goes a new 20,000-barrel steel tanker barge made by Barium's Wiley Manufacturing Company, Port Deposit, Maryland.

SHOULDERING THE LOAD at Oregon's new McNary Dam on the Columbia River 190 miles east of Portland is this husky 70-ton Whirley crane made by Barium's Clyde Iron Works, Duluth, Minnesota.

NEW MAGNESIUM WINGS for Lockheed's F-80 jet, now under service flight test. Designed by Barium's East Coast Aeronautics, Inc., Pelham Manor, N. Y., they have fewer parts, carry more fuel.

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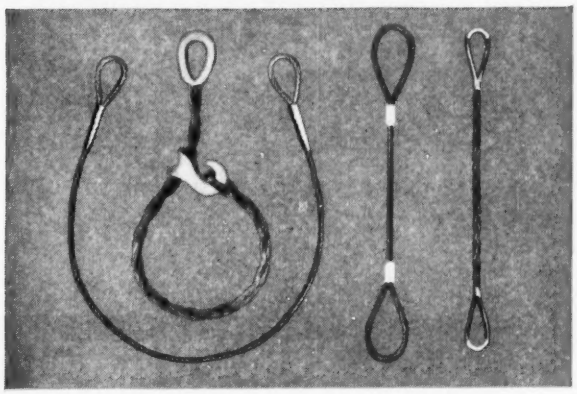
Wire Rope

for cranes, hoists, elevators, and all equipment

From Macwhyte's complete line of a thousand and one sizes and types, you get the right rope for your equipment. Thoroughly lubricated, PREformed, engineered to give long, low-cost service. *Send for Catalog G-15.*

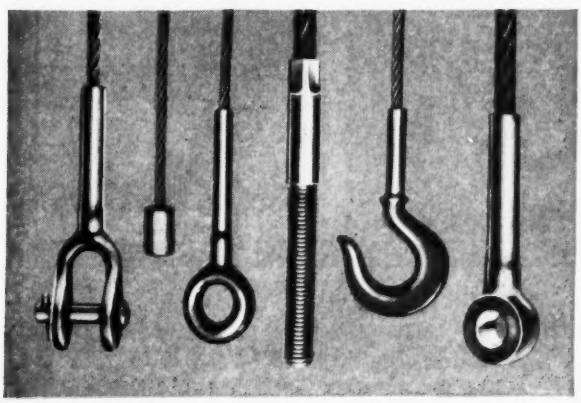


WIRE ROPE

Slings

for lifting and moving materials, equipment in production or maintenance

There are hundreds of types and sizes of Macwhyte Round-Braided, Flat-Braided, Single-Part, and Grommet Slings. All are custom made in length, capacity, and flexibility to meet your needs. *Send for Catalog S-8.*



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Assemblies

for machine parts, controls, and operating devices

Macwhyte Safe-Lock wire rope assemblies are made to order in length, strength, and flexibility desired. Terminals are permanently attached to one or both ends. There are many standard types. *Send for Catalog 5201.*

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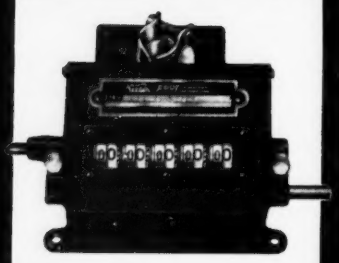

Added Evidence that——

Everyone Can Count on VEEDER-ROOT

Set the predetermining wheels for any run you want. Then, when the counting wheels reach the pre-set number, an electrical contactor makes or breaks the circuit to light a light, ring a bell, or trigger a stop-motion. Yes, this V-R Predetermining Counter is an efficient variable control for *many* types of stop-motion. Short runs and over-runs are prevented on a wide range of machinery, from coil winders to textile looms. Now, figure out how *you* can use this Cost-*Count*rolling Counter. Then write:

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"Counts Everything on Earth"

This Week in Metalworking

STEEL

Vol. 133 No. 6 August 10, 1953

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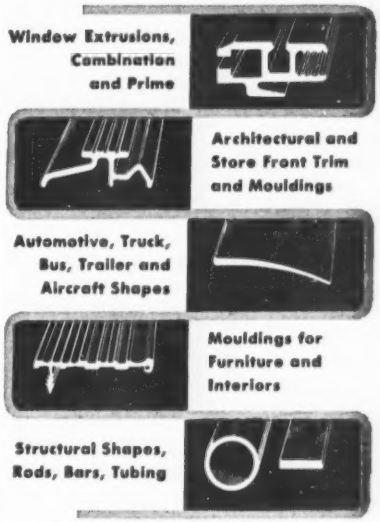
PE ALUMINUM EXTRUSIONS
designed and produced to fit your needs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Architectural and Store Front Trim and Mouldings
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by an exclusive method

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PAWTUCKET

"THE BOLT MAN"

MANUFACTURING COMPANY

327 Pine Street Pawtucket, R. I.

THE PLACE TO SOLVE YOUR BOLT PROBLEMS

behind the scenes

Metal Show Issue

Do you remember that old bromide about necessity being the mother of invention? We'd like to improvise on this theme for a minute to tell you about one of the things STEEL's editors are planning for the annual Metal Show Issue scheduled for publication on October 12.

Used to be that the United States could dip down into its good earth and bring up all the ore, oil and other basic raw material it needed. Had so much, in fact, that for years and years we played a continual game of Brewster's Millions.

Now, the honeymoon is over! World War II took *plenty* out of "the land of . . ."

For the past decade, American Industry has faced continuing shortages of materials. But, paradoxically, these very shortages have mothered a host of new materials, new processes and new products.

In the Metal Show Issue this year, STEEL will attempt to tell you how the proper use of these new materials and satisfactory alternates can actually result in better products at lower unit cost.

In a comprehensive story called *Selecting the Right Metallic Material for the Job,* Dr. Allen G. Gray, technical editor, will describe the wide range of new and alternate metallic materials available for given jobs. He will tell *what* they are and *how* they may best be used in terms of both processing techniques and product application.

As an added feature and incorporated with this article will be a check-list in tabular form showing the materials that are of current significance, what they are, where they may be obtained and how they may be used to best advantage.

Sounds to us like this is something you folks can put to real good use.

Tante Grazie Signori!

We bloodhounded that headline right out of J. E. Wessely's *Italian-English* dictionary. The thanks are prompted by a very excellent review of STEEL's *Specification Handbook* by Signore D. Gualandi in *Rivista Alluminio,* a review service for Italian readers interested in light metals and various scientific, technical, industrial and economical questions concerning these metals.

We are particularly grateful to Signore Gualandi in the paragraph where he says:

"E indubbio che i tecnici americani trarranno ampio giovamento da questo manuale. In Italia potranno giovarsene gli interessati alle forniture che debbono essere effettuate secondo le norme di collaudo americane."

Shrdlu Translation: No doubt about it, this is the finest! American technicians really lean on this manual. In Italy, we too can derive great help from it particularly on work based on American specs.

How Many Mangoes?

Three men who had a monkey bought a pile of mangoes. At night one of the men came to the pile of mangoes while the others slept and, finding that there was just one more mango than could be divided exactly by three, tossed the extra mango to the monkey and took away one third of the remainder. Then he went back to sleep. Presently another of them awoke and went to the pile of mangoes. He also found just one too many to be divided evenly by three, so he tossed the extra one to the monkey, took one third of the remainder, and returned to sleep. After a while the third rose also, and he too gave one mango to the monkey and took away the number of whole mangoes which represented precisely one third of the rest.

Next morning the men got up and went to the pile. Again they found just one too many, so they gave one to the monkey and divided the rest evenly. What is the least number of mangoes with which this can be done?

Shrdlu

(Metalworking Outlook—Page 45)

NO BETTER
BLADES OR BANDS
Starrett®
You can't buy better hacksaws, band saws or band knives than STARRETT. They're precision made by the "World's Greatest Toolmakers" in a new streamlined plant to give you a lot more clean, fast, trouble-free cutting. By simply specifying STARRETT blades or bands you can count on better, faster production —less cost—less time out for blade changing . . . whether you cut, saw or slice.
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DIAL INDICATORS • STEEL TAPES • PRECISION GROUND FLAT STOCK
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Buy THROUGH YOUR INDUSTRIAL DISTRIBUTOR
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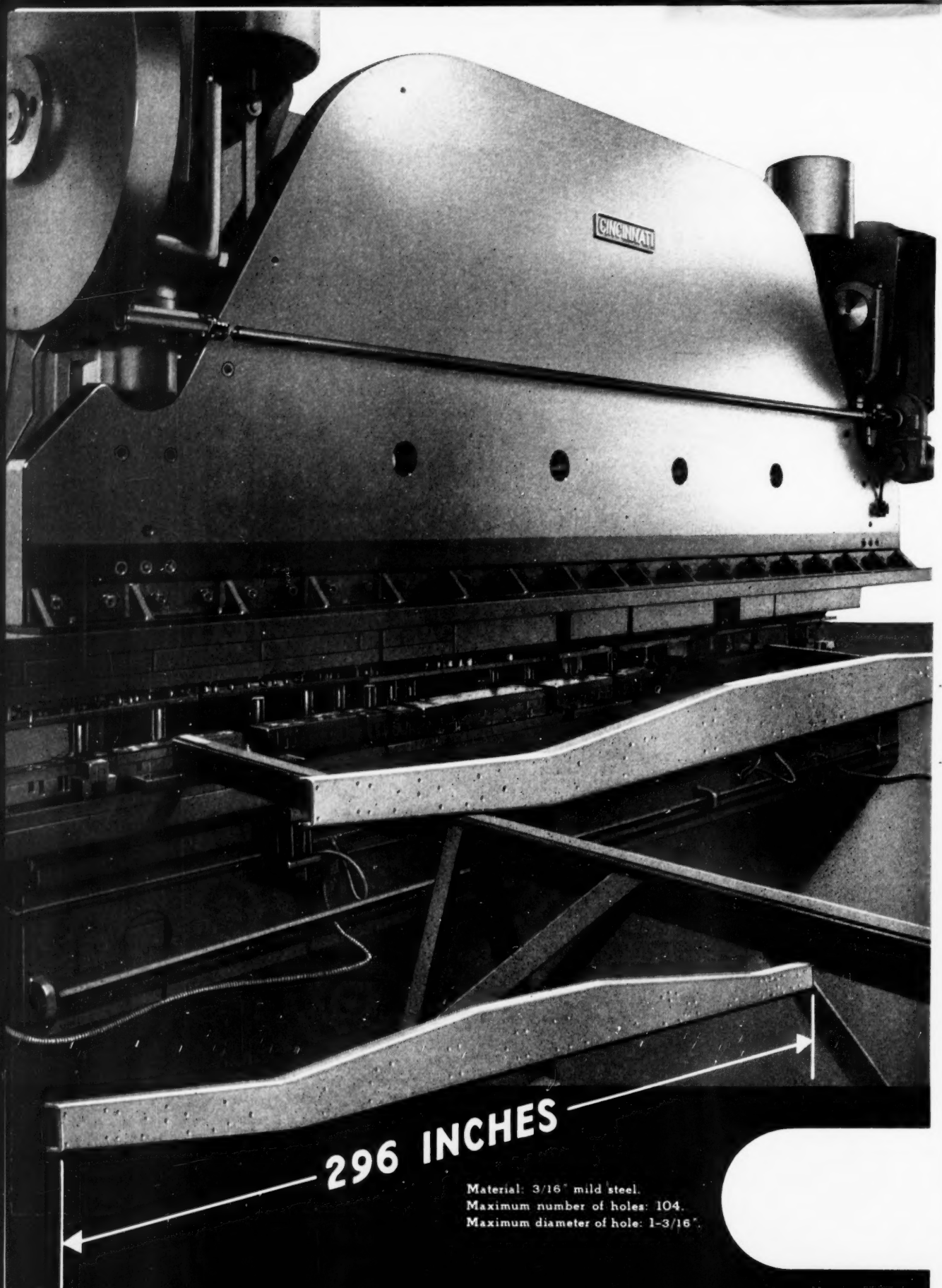

Material: 3/16" mild steel.
Maximum number of holes: 104.
Maximum diameter of hole: 1-3/16".

PUNCHING

104 holes every 10 seconds *accurately*

The multiple punching of these holes must be very rapid, and their location as well as spacing must be held accurately.

The assembly of these 24′ trailer frames is smooth and economical with no costly hand fitting.

With this punching equipment, position, size and spacing of holes may be changed quickly and at low cost.

The Brake can perform many other operations as desired . . . converting from one operation to another quickly and at low cost.

Write for the New comprehensive Catalog B-4.

Photo—Courtesy Youngstown Steel Car Corporation.

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CINCINNATI

All over your building, fire sets its traps. In dip tanks, transformer vaults, storage spaces. In fact, wherever it can stop your business in its tracks. Make sure you don't fall victim. Post a KIDDE Portable Extinguisher next to every fire hazard.

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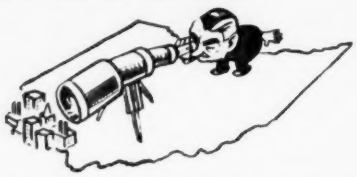
860 Main Street, Belleville 9, N. J.

Walter Kidde & Company of Canada, Ltd., Montreal, P. Q.

LETTERS
TO THE EDITORS

Die Casting Surveyed



We notice in a recent issue of STEEL a reference to a survey Penton Publishing Co. made in the Cincinnati, O., area concerning usage of die castings.

We presume that your survey has been published and we wish to inquire as to how we may obtain a copy.

R. L. Sheneman
manager, Market Research
Kaiser Aluminum & Chemical Sales Inc.
Chicago

• *The survey in limited supply is available without charge by request from* STEEL's *sister Penton publication, Machine Design, Penton Bldg., Cleveland 13.—ED.*

Metallurgy Without Air

I want to congratulate you on the fine job you did on "Vacuum Metallurgy" (June 29, p. 88). We feel this is by far one of the best articles we have seen on the subject and would like very much to obtain reprints.

David E. Stokes
F. J. Stokes Machine Co.
Philadelphia

• *Reprints are available through* STEEL's *Reprint Department.—ED.*

In the June 15 issue of STEEL on p. 89 is the item headed "Pays Off" in which I was interested to read "Vacuum melted steel is producing ball bearings that show durability beyond the limits of experiments designed to measure their failure." I wonder if you could give me the name of the person or firm where I may obtain more detailed information on the subject.

J. F. Sewer
Samuel Fox & Co. Ltd.
United Steel Companies Ltd.
Sheffield, England

• *Write to G. J. Crites, metallurgist, F. J. Stockes Machine Co., 5000 Tabor Rd., Philadelphia.—ED.*

Reference to Plating Story

We enjoyed your article "What To Plate" (July 20, p. 84). In order that it may be available for quick reference, please forward two reprints.

A. R. Kunkle
Engineering Laboratories
York Corp.
York, Pa.

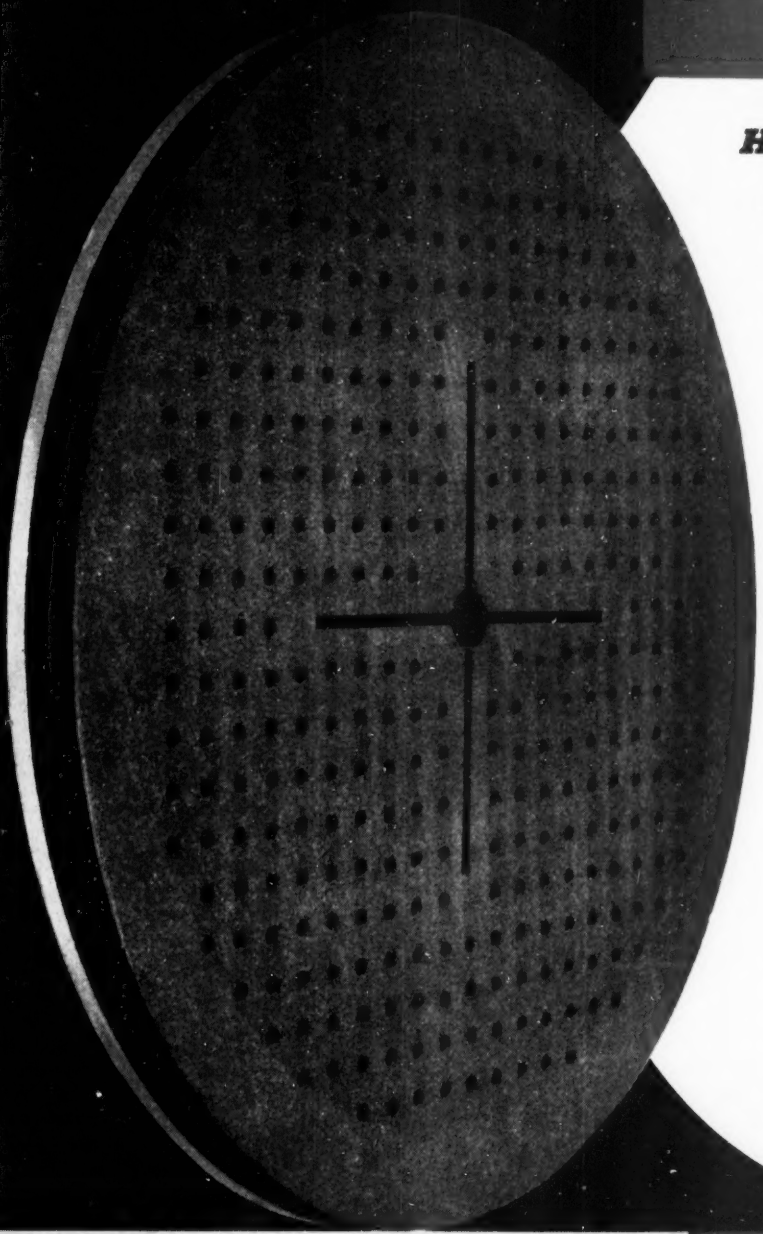
• *They're being sent.—ED.*

No Changer There

We noted your very interesting article "Vending Machines: From Nuts to Soup" (July 13, p. 61). Included was a statement that "Officials of Viking Tool & Machine Corp., Belleville, N. J., report that in the works is a machine that can handle anything from a nickel

Please turn to page 12

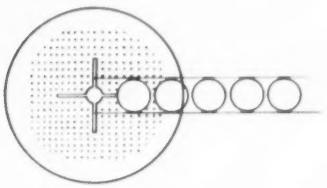
Gardner Abrasive Engineering



How a new type disc improved coolant distribution . . . made feed-thru grinding more efficient

THE PROBLEM

When grinding parts approximately 4" diameter on a double spindle grinder with feed-thru fixture, inaccurate work and some burning was experienced. Coolant introduced through hollow spindles did not properly reach grinding area.



THE SOLUTION

Four 1/4" wide radial slots extending out from center hole were introduced into abrasive to insure a free, uniform flow of coolant to work. Result: Stock removed without burning; required tolerances and production maintained.

Gardner Abrasive Engineering offers experience derived from making both the grinding machines and the abrasive discs. It considers machine performance first and then evaluates how grade and grain of abrasive affect grinding results. If standard abrasive discs won't do the job, discs are made *just for you.*

For help with your grinding problem, consult the Gardner Abrasive Engineer. 111A

GARDNER MACHINE COMPANY
420 Gardner St., Beloit, Wisconsin, U.S.A.

GARDNER
abrasive discs

FOR SPECIAL REAMERS . . . REMEMBER

GORHAM

They may not *look* alike, but all of the special tools on this page share a common function . . . *because every one is a reamer!* Each was engineered and manufactured by Gorham Tool Company to provide a practical solution to a specific production machining problem for one of our customers.

Actually, these reamers represent just a few of the many special-purpose cutting tools produced by Gorham. Others include milling cutters and end mills, inserted blade cutters, flat and circular form tools, profile cutters, and carbide tipped tools of every description. Gorham "specials" are turning problems into profits in thousands of plants every day . . . and the one we engineer for you will solve *your* next production machining problem, too! Take advantage of our experience.

Your nearby Gorham Field Engineer is a qualified cutting tool expert in both practical design and actual application, and his assistance is yours without obligation. Just write for his name, or send details of your problem direct to us. We'll have him get in touch with you promptly.

Gorham TOOL COMPANY

"EVERYTHING IN STANDARD AND SPECIAL CUTTING TOOLS"

14401 WOODROW WILSON • DETROIT 3, MICHIGAN

WEST COAST WAREHOUSE: 576 North Prairie Ave., Hawthorne, Calif.

LETTERS

Concluded from page 10

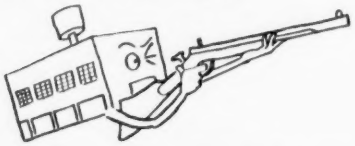
through $1.50 in coins for use in chain stores."

This is a mis-statement as we do not have such a development in progress nor do we contemplate any.

Clarence Lommerin
secretary & treasurer
Viking Tool & Machine Corp.
Belleville, N. J.

• *Our error.—ED.*

Warehouses Set Sights



In STEEL for July 13 there is a very informative article headed "Warehouses Set Sights To Meet Challenge" (p.67).

We are wondering if reprints of this article are available and if so on what basis they may be furnished to us for distribution.

S. B. Jones Jr.
general manager of sales
Congdon & Carpenter Co.
Providence, R. I.

• *Reprints are available through our Reprint Department. Cost depends upon the quantity ordered. Full details are on the way.—ED.*

Difficult Task

I have been assigned the task of developing an over-all formula for the replacement of machine tools, equipment and facilities. An article "How To Set Up Successful Equipment Replacement Program" by C. C. Higgins in the Feb. 19, 1951 issue of STEEL has been referred to me as an excellent presentation on this subject.

Will you kindly mail me a tear sheet of this article.

C. H. Warren
plant engineer
Mare Island Naval Shipyard
Vallejo, Calif.

• *Tear sheets have been sent. For more information on this subject, write Machinery & Allied Products Institute, 120 S. La Salle St., Chicago and Gisholt Machine Co., Madison 10, Wis.—ED.*

Why a Worker Quits

We would like permission to reprint Floyd Lawrence's article in the June 29 issue of STEEL, on why a worker quits (p. 61).

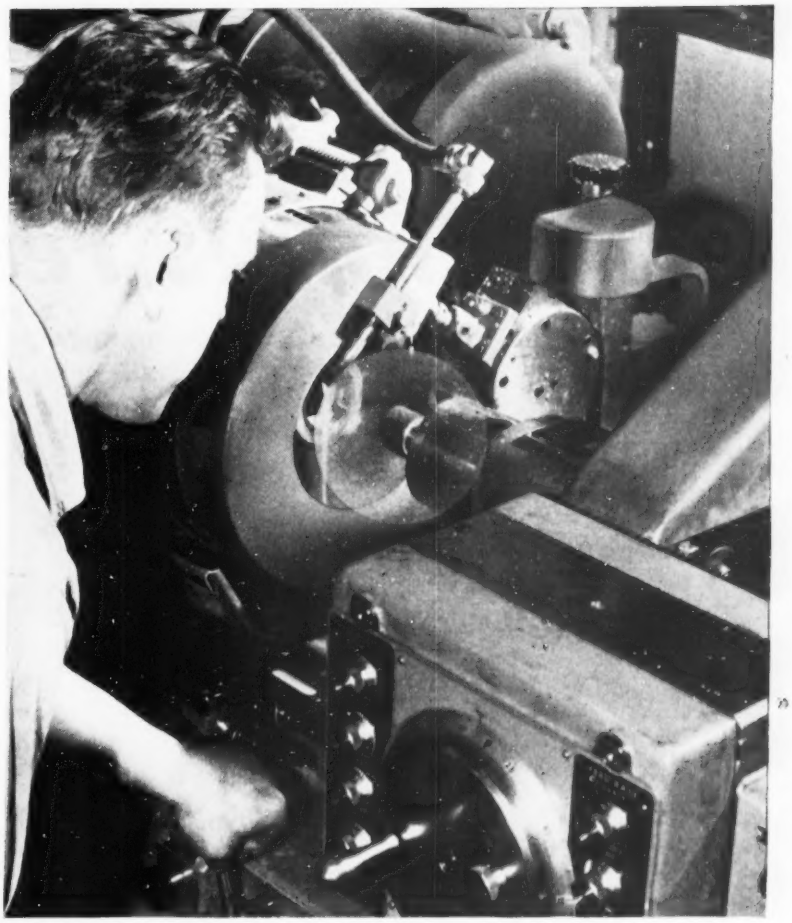
We would like to send this to some of our prospective clients on the value of supervisory training as it relates to employee turnover.

M. R. Liles
Hall & Liles
Detroit

• *Permission granted.—ED.*

Step up your internal grinding... boost your profits ...with this new

"TOUCH OF GOLD"



High production hits its peak when the "Touch of Gold" is added with Norton G Bond wheels for internal grinding.

Norton G BOND wheels are precision-processed for identical precision-performance

Built by Norton's exclusive *precision-processing*, the new Norton G Bond wheels for internal grinding are completely uniform in structure. Just pull off a worn out wheel and slip on a new one — and you'll get exactly the same grinding action every time. Eliminating the fussing with the timing cycle, they save you time and money on every job.

Added to this, the new Norton G Bond, designed for precision and semi-precision grinding, is one of the greatest advancements in vitrified bonds ever made. Holding each abrasive grain for maximum cutting action, it assures a constant grinding surface of fresh, sharp cutting edges. As a result, G Bond wheels cut cooler . . . remove material faster . . . produce a better finish . . . produce more pieces per dressing . . . hold their shape better.

Thoroughly job-proved. Typical reports from internal grinding customers after switching to G Bond wheels: *Total pieces per wheel jumped from 200 to 400... Twice as many roller bearing races ground per dressing . . . Grinding cycle reduced from 7/10 minute to 4/10 minute ...Pieces per dressing increased from 9 to 15.*

Precision-processed for identical top performance, Norton G Bond wheels help cut costs on this centerless internal grinding job.

A faster, better finish on this aircraft engine cylinder is assured. Norton G Bond internal grinding wheels are on the job!

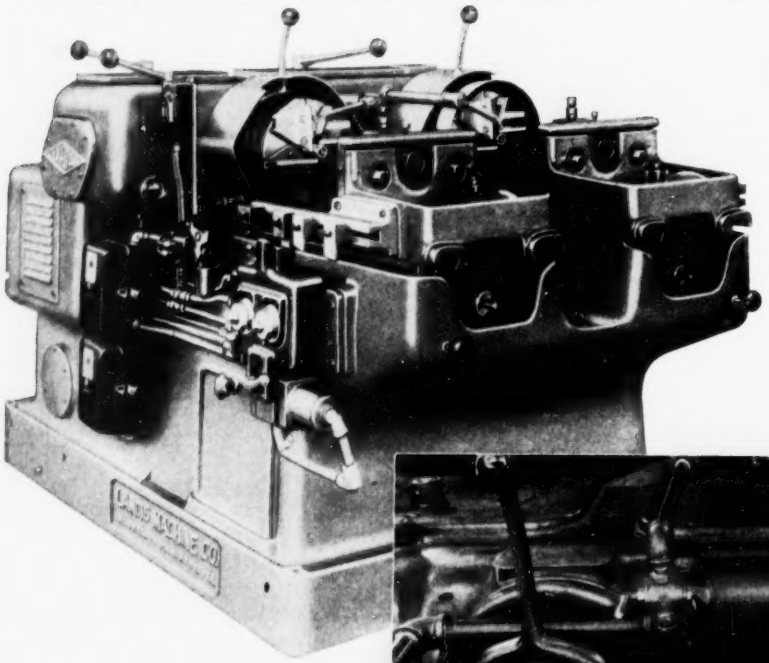
W—1507

See your Norton distributor for further facts on this value-adding, profit-boosting "Touch of Gold" for your internal grinding. He'll gladly arrange a test in your plant. Or write to NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities — see your telephone directory, yellow pages. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

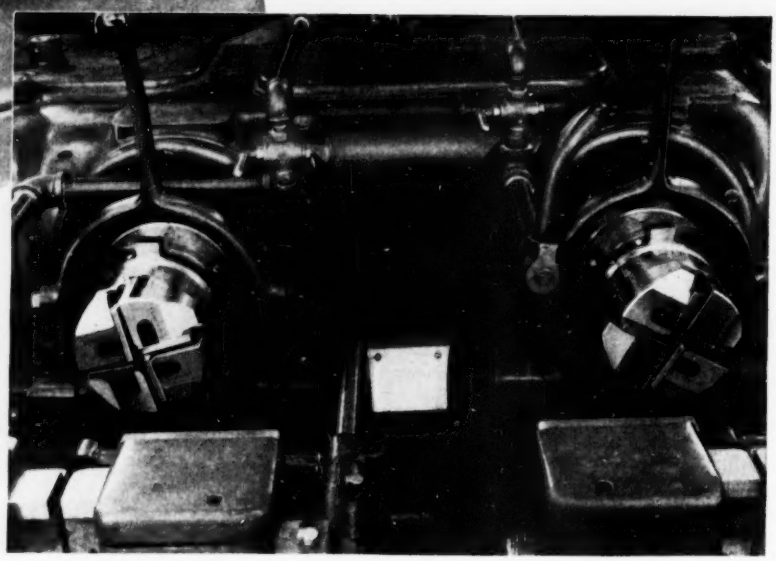
NORTON
ABRASIVES
Making better products... to make other products better

HOLLOW MILLING

Extra LANDIS Feature . . .



LANDIS Die Heads, in addition to conventional threading operations, can be equipped with LANDIS Turning Cutters which will perform turning, grooving, forming, and facing by the hollow milling method. Milling operations may be performed by LANDIS Heads applied to automatic screw machines, turret lathes, or LANDIS leadscrew-type or hydraulic-feed threading machines, and other positive-feed-type machines.



Many Production Advantages

Hollow milling by this method offers an increased efficiency occasioned by the application of a multiple number of cutting tools. The feed rate is thus approximately equal to that of a single tool, multiplied by the number of simultaneously-functioning cutters in the unit—four or six for LANDIS Heads.

The LANDMACO Double Head Leadscrew Threading Machine affords a particularly efficient hollow milling method. One carriage will perform the milling operation while the other carriage is being loaded by the operator, thus allowing consistent continuous production. In addition it is entirely practical to perform milling operations on one spindle and conventional threading operations on the other.

LANDIS Turning Cutters

LANDIS Cutters are economical tools for they are usable for most of their original length. Only the rake angle needs regrinding—a quick and simple procedure. One set of cutters will machine a wide diametrical range of work, and cutting speeds will range from 30 to 70 linear feet per minute.

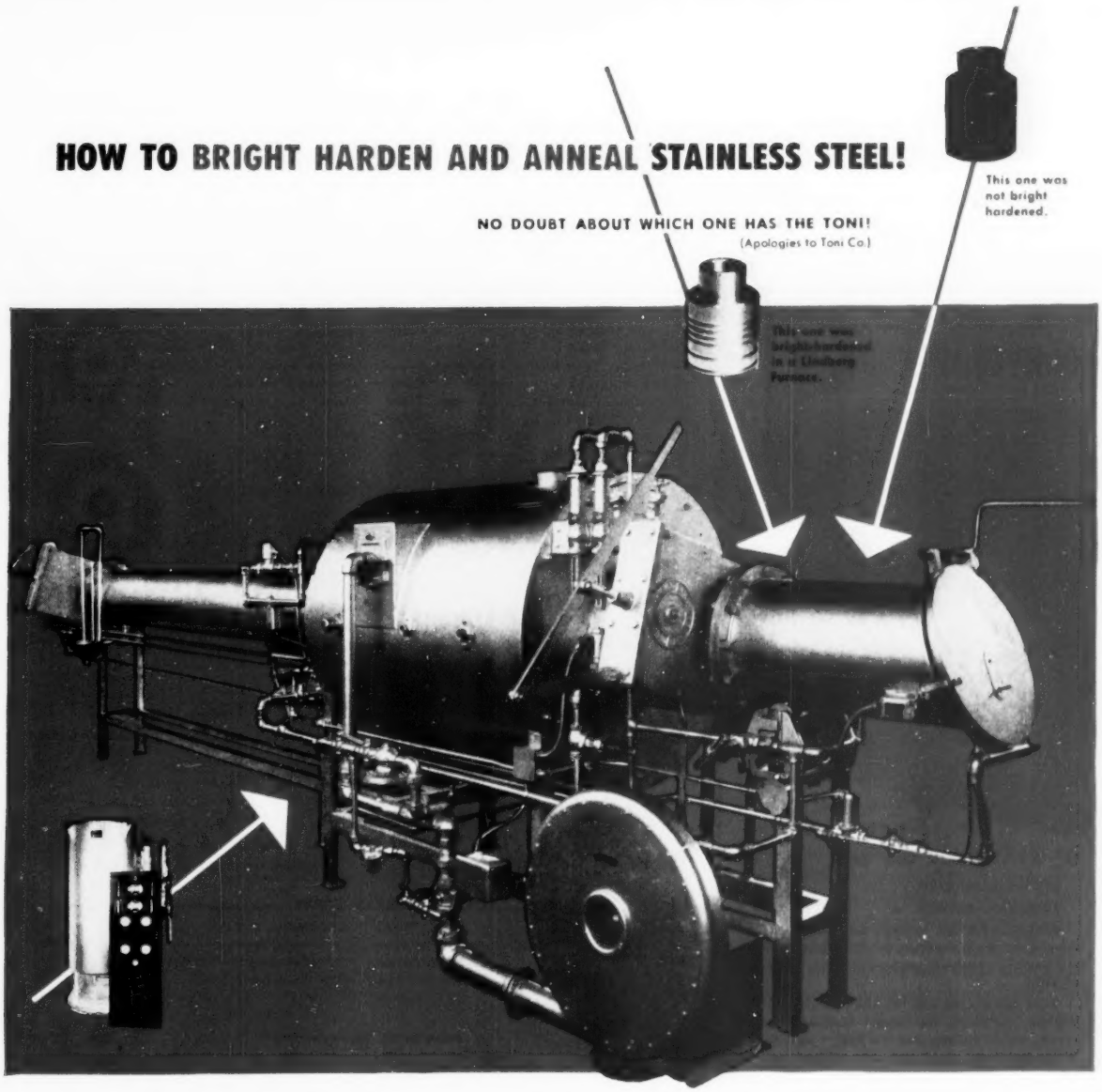
Wear and breakage of tools and spoiled work is held to a minimum. The cutting edges of the cutters can be precisely and uniformly located with relation to the center line of the work since they are diametrically-opposed in the cutting position. Thus with cutting strains evenly distributed, the workpiece is never forced out of alignment.

Additional information will be supplied on request—please include specifications.

THE LANDIS *Machine* CO. 50TH ANNIVERSARY **WAYNESBORO PENNSYLVANIA**

HOW TO BRIGHT HARDEN AND ANNEAL STAINLESS STEEL!

NO DOUBT ABOUT WHICH ONE HAS THE TONI!
(Apologies to Toni Co.)



If your production requirements call for the bright heat treating of stainless steel, completely free from oxidation and discoloration . . you'll want to know more about this amazing Lindberg Stainless Steel Heat Treating Furnace, many of which have been in successful use throughout the country for 4 years. They are *specifically designed* for the heat treatment of stainless steels and other high alloy materials.

This process eliminates the need for operations such as pickling, sandblasting, and machining . . which are not only costly and time-consuming, but also often disturb the delicate balance of the alloying elements on the surface of the metal.

Lindberg Stainless Steel Heat Treating Furnaces are built with purging chambers at *both* the charging and the discharging ends. This eliminates the chance of work chamber atmosphere becoming contaminated by either oxygen or water vapor . . which will oxidize stainless steel.

These furnaces use protective atmosphere supplied by Lindberg HYAM Hydryzing Generators. Atmosphere consists of dissociated ammonia (75% hydrogen and 25% nitrogen . . dew point, minus 60°F).

Your "Lindberg man" will be glad to tell you more . . call him.

LINDBERG FURNACES

Lindberg Engineering Company • 2441 W. Hubbard Street • Chicago 12, Illinois

NOW you can

BRIGHT-ANNEAL STAINLESS

on a continuous production basis, with The

SARGEANT & WILBUR Controlled Atmosphere

CONVEYOR FURNACE

PARTS MADE OF STAINLESS can be

BRIGHT-ANNEALED,

BRIGHT-HARDENED, or

BRIGHT-BRAZED without oxidation . . . they come out scale-free, bright, and clean. No pickling required, no tumbling, no sand blasting.

With our special S. & W. alloy for bright-brazing stainless, the color matches the metal; resists dulling; and the joint is practically invisible. *Gold and silver parts* are soldered in the same continuous-production furnace with equal success.

Your samples processed free. If you want to see some of your own work bright-annealed, bright-hardened, or bright-brazed in a conveyor furnace, send us samples and specifications.

SARGEANT & WILBUR, INC.
180 Weeden St.
PAWTUCKET, R. I.

Send your illustrated folder "How to BRIGHT-ANNEAL STAINLESS in the S. & W. Conveyor Furnace."

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Company .....

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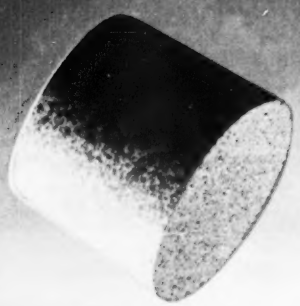
The price of Solo-H is 50 cents per oz. in any quantity. Write, wire or phone for details.



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BEAUTY is only one of many reasons why Phillips Screws help you build a better product. These screws set up tighter, resist vibration. They are distinctively designed to give maximum strength of head, maximum driver strength. What's more, they cut driving time up to 50%, eliminate driver skids and split screw heads. Whether you use Phillips Wood, Machine, Tapping Screws or "Sems", you save time, work, money.

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TODAY'S...AND THE FUTURE'S...FINEST FASTENER

How to reduce out-of-line when machining outsize

Increased work capacity of G&L 50 Series Horizontal Bar with new underarm support slashes handling, setup and job time on these difficult 100-ton steel castings

OPEN construction plus the new underarm arrangement of the G&L 50 Series Horizontal Boring, Drilling and Milling machine has greatly simplified the job of machining these huge rolling mill housings.

High accuracy as far as 60" from headstock

This new development permits many milling, facing and boring operations in one setup . . . at right angles to the spindle . . . as far as 60" from the headstock. An offset milling head can be mounted on the support to reach limited-access surfaces. And flatness and parallelism of all milled surfaces are held to close limits.

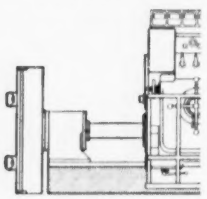
For example: With the housing set on its side (see photo) it's possible to mill and bore the inner window surfaces . . . in fact the complete "window" in one setup. When the operation shown is completed, the operator merely rotates the angular milling attachment to mill the upper angular surfaces. The machine spindle drives the cutter through gears in both the anti-friction bearing support block and the milling head.

Cross feed is accomplished through synchronized movement of the underarm and spindle. Longitudinal feed movement of the machine column on its runway is used to mill the upper and lower side sections of the window.

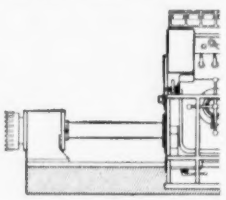
Do you need extra capacity?

This new underarm support is available on all new G&L 50 Series Floor type machines (6" or 7"). If you'd like to know how you can keep handling, setup and labor costs in line when working with huge castings, contact your nearest G&L representative or write direct. BUT DON'T DELAY...DELIVERY ON G&L MACHINES MAY BE BETTER THAN YOU THINK.

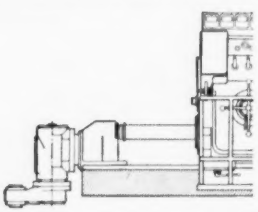
TYPICAL WAYS YOU CAN USE UNDERARM ARRANGEMENT.



Underarm extended spindle support with continuous feed facing head.



Underarm extended spindle support with face mill.



Underarm right angle swivel milling attachment with offset arrangement.

GIDDINGS & LEWIS

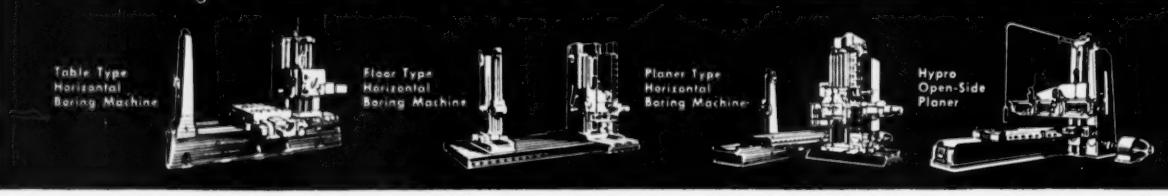
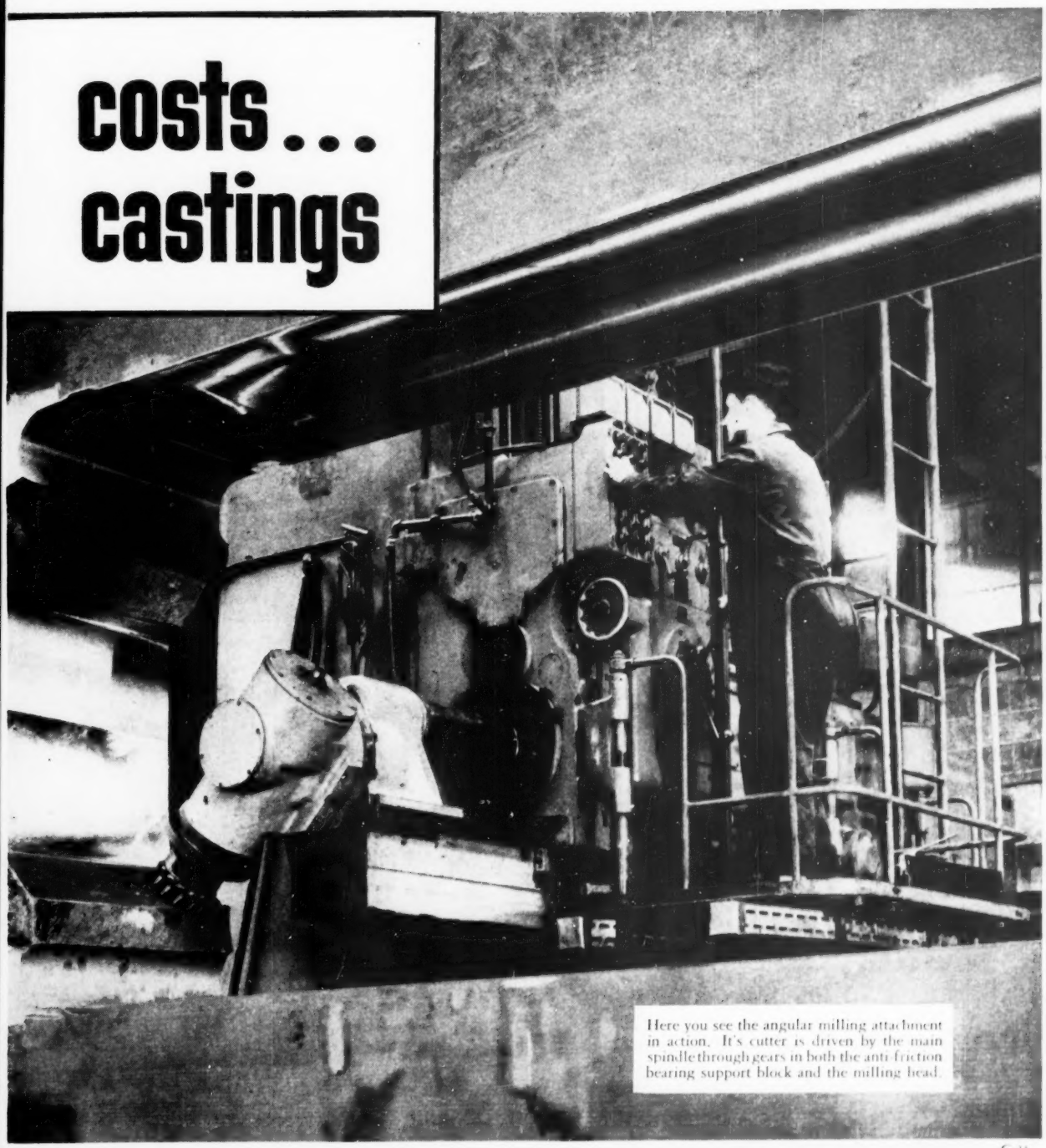


Table Type Horizontal Boring Machine
Floor Type Horizontal Boring Machine
Planer Type Horizontal Boring Machine
Hypro Open-Side Planer

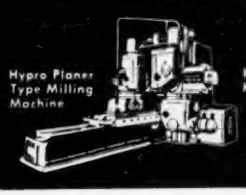
costs... castings



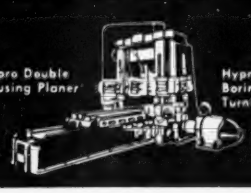
Here you see the angular milling attachment in action. It's cutter is driven by the main spindle through gears in both the anti-friction bearing support block and the milling head.

G-25

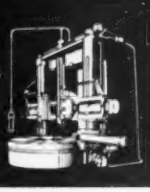
MACHINE TOOL CO.



Hypro Planer Type Milling Machine



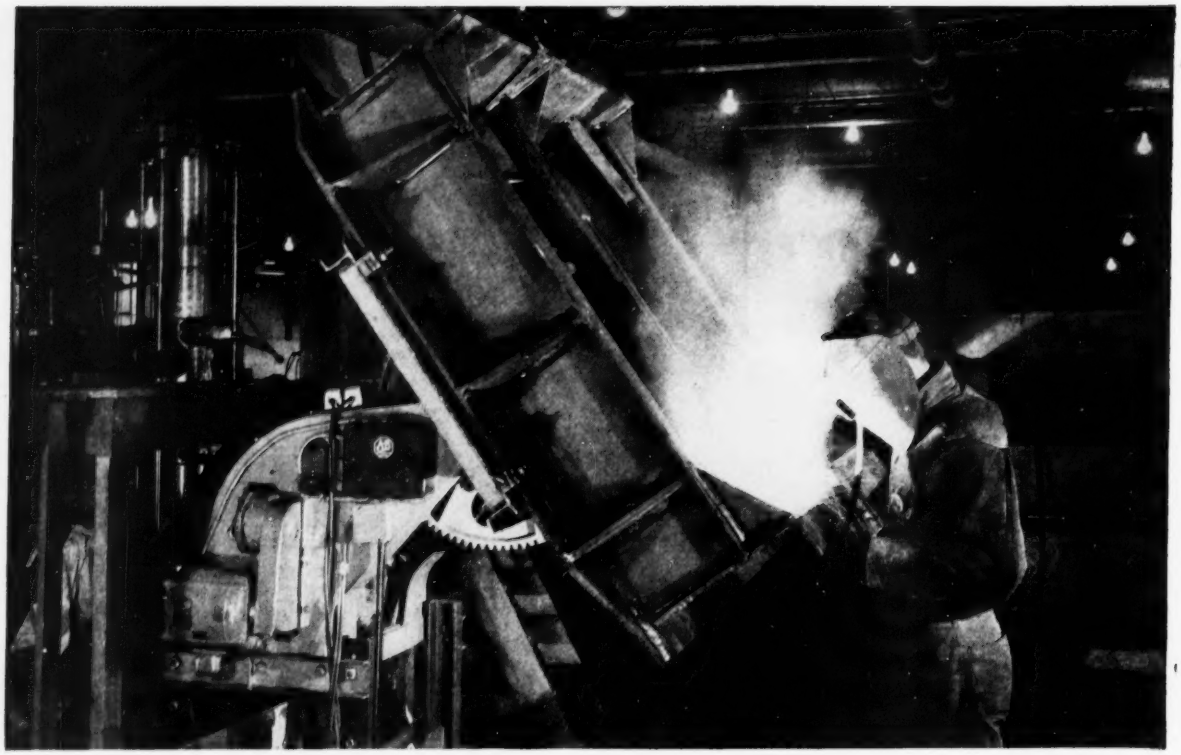
Hypro Double Housing Planer



Hypro Vertical Boring and Turning Mill

G&L HYPRO

FOND DU LAC
WISCONSIN



WORTHINGTON WELDING POSITIONER ELIMINATES time-wasting handling of the work-piece . . . increases arc-time by tilting the work into position for continuous, economical downhand welding. Capacities from 100 lbs to 30 tons. Also: Turning Rolls from 3 to 150 tons, stationary and self-propelled.

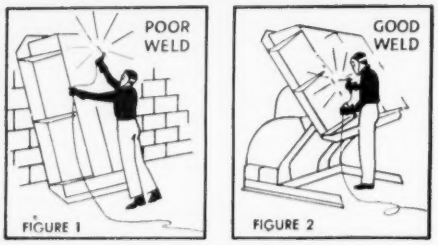
A way to get more and better welding from your welders

Every minute your welders spend climbing, turning and propping is *lost* welding time.

Turn this waste time into *all arc-time* with Worthington Welding Positioners that tilt or turn all welds into position—*without delay*—for *continuous* downhand automatic or manual welding. Today's labor scarcity makes this increased production more important than ever.

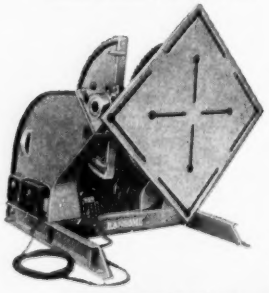
These Positioners lower costs and boost production up to 50%. Downhand welding is *quicker* (only one pass instead of two or three) . . . *better* (deeper penetration with higher current, heavier electrodes, faster deposition of weld metal) . . . *neater* (weld metal levels itself). There's less rod waste, too.

Where can you see a Worthington Welding Positioner at work near you? Just write Worthington Corporation, Plainfield, N. J., for this information or for Bulletin 210D.



HOW WORTHINGTON WELDING POSITIONERS PRODUCE BETTER WELDS

When the welder has to climb over, prop or flop the work-piece, he may only be able to use downhand welding over a limited area (Figure 1). With a Worthington Welding Positioner, the work is continually tilted or rotated automatically into position for downhand welding (Figure 2).



WORTHINGTON'S UNIVERSAL TABLE TOP makes the Welding Positioner as profitable on job work as mass production. Those "T" slots make the table adaptable to any shape of work-piece and a wide range of sizes. No special jigs or fixtures needed.

Y.2.3

WORTHINGTON

Welding Positioners
Turning Rolls

When Uniformity Is a Necessity—

Specify Strip Steel by

WEIRTON

The rigid uniformity of Weirton quality is the result of superior equipment and complete control from mine to finished strip. Weirton's up-to-date manufacturing facilities and advanced mill procedures have made uniformity a routine matter. This uniformity of cold-rolled strip steel offers the advantages of faster production, minimum costs, and fewer rejects.

Weirton customers also enjoy the advantage of having strip steel made to satisfy their most exacting requirements. So when your plans call for cold-rolled strip steel—see Weirton and be sure.

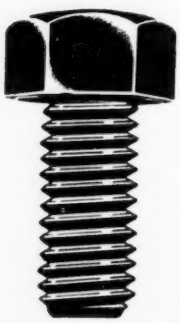
WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

TOUGH HEADS...

SHARP THREADS...



Republic Upson Cap Screws

● Tough heads to outlast hard-muscled mechanics, armed with heat-treated wrenches...

Sharp threads that will tighten smoothly and powerfully with full engaged-thread area to resist pull-out.

Republic Upson Cap Screws are but one member of the family of Republic Upson products . . . more than 20,000 styles, sizes, and types of highest-quality precision-made fasteners for all industries.

REPUBLIC STEEL CORPORATION
Bolt and Nut Division
CLEVELAND 13, OHIO • GADSDEN, ALABAMA
Export Department: Chrysler Building, New York 17, N. Y.

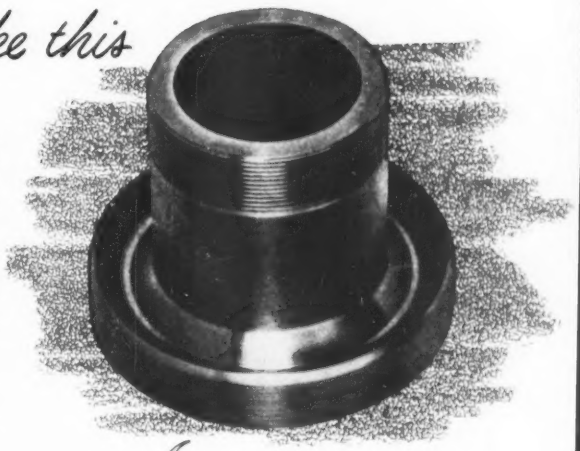
Republic

REPUBLIC STEEL

UPSON QUALITY BOLTS AND NUTS

automatic performance reduces costs

even on SHORT RUN *jobs like this*



A MOTOR MANUFACTURER who made this commutator sleeve, and similar components, in lots of 300 to 800 and in several sizes, said *"on a modern type, hand-operated turret lathe our net output varied from 2½ to 3 pieces per hour, depending upon conditions"*.

Present output on his new Acme-Gridley Model M Single Spindle Automatic has more than doubled, as the job facts reveal. Much of this increase is due to Model M design features which avoid those so-called "conditions". Most important among these features is. . .

—fully automatic performance which guarantees a controlled cycle time and uniform precision—piece after piece

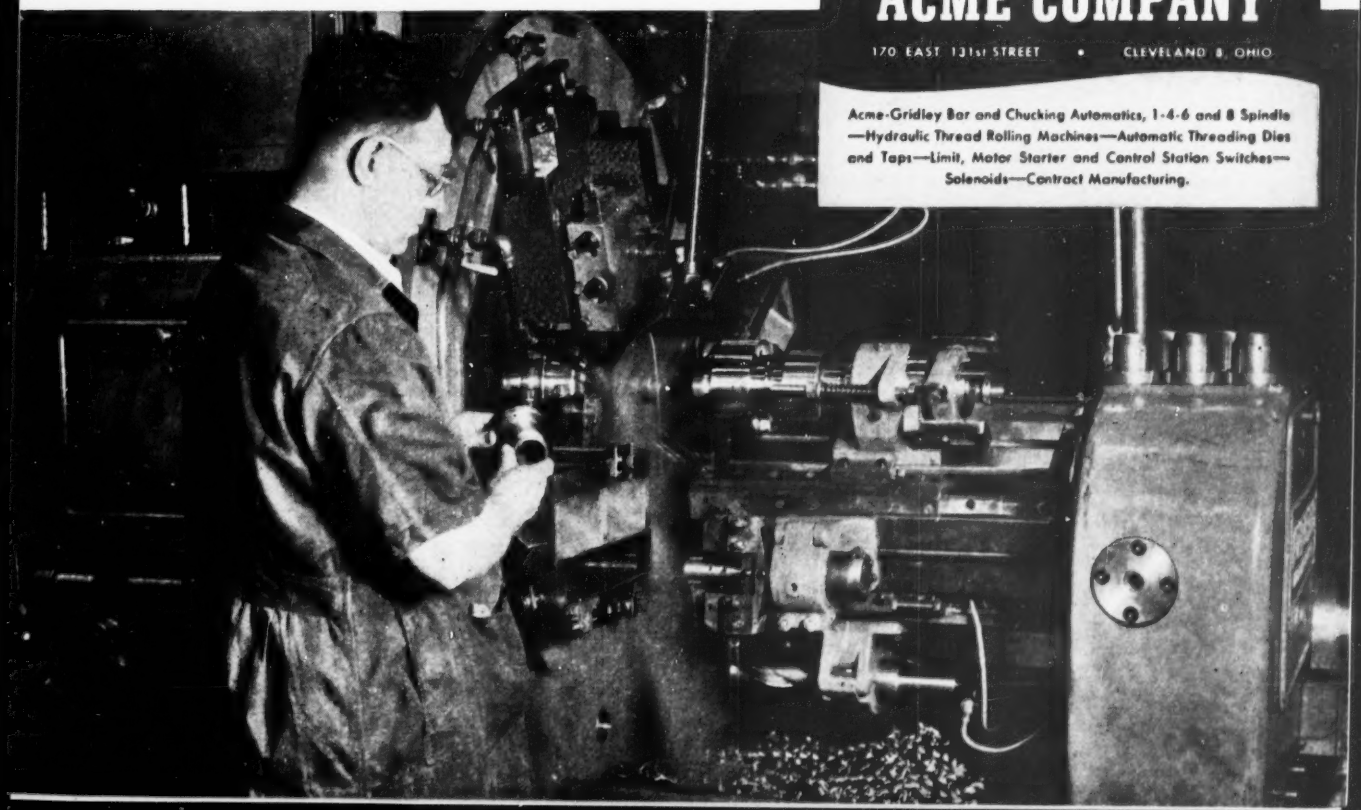
In other shops, these newest Acme-Gridley Single Spindle Bar Automatics, on hundreds of small and large lot jobs, are *2 to 10 times faster than the machines they replaced.* Ask for Catalog M-50A—better still, ask us to quote.

JOB FACTS:

Part: Commutator Sleeve
Size: 3⅜" dia. 2¾" long
Material: C-1030 Steel
Machine Time: on Acme-Gridley 3½" Model M Single Spindle Automatic—10½ minutes.
Operations: 11, including rough and finish trepan on O.D. of flange for smooth finish, reaming hole for close concentricity and threading with automatic Vers-o-tool to class 3 fit.
Former Time: on current model hand operated turret lathe—20 to 25 minutes.

Other Model M time and cost reducing advantages are—

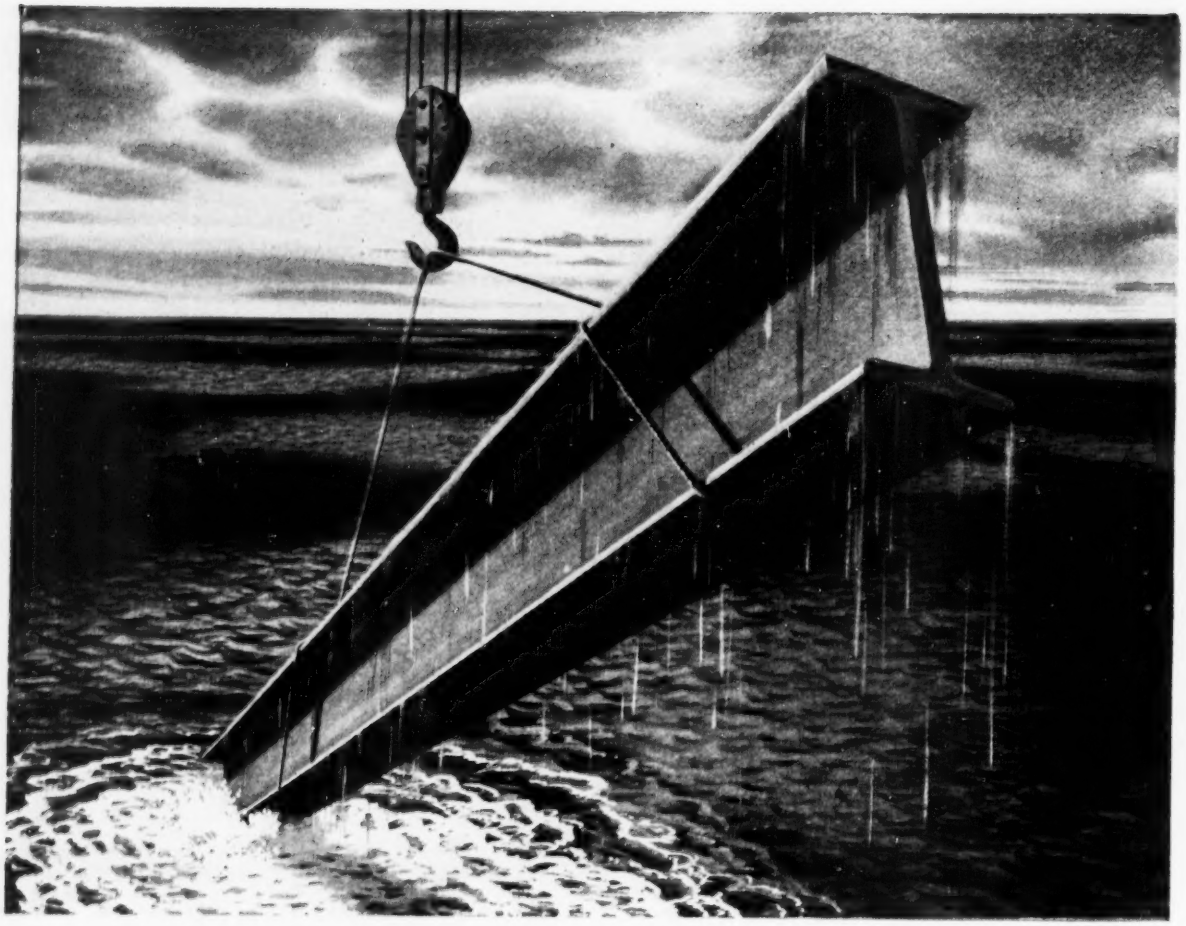
- Eight independently operated tool slides and three automatic spindle speed ranges selective to suit each cut, whether for use of carbide or high speed tools.
- Turret indexes in 1 second and its independent tool slides provide for overlapping operations such as several short end cuts while the heavy cuts are continued from the side slides.
- The Model M also features standard cams, interchangeable spindle speed and feed change gears, and wide open tooling zone—all quickly accessible. So the set up time for changing jobs to secure fully automatic performance on similar work does not exceed that of the hand operated lathe.



The NATIONAL ACME COMPANY

170 EAST 131st STREET • CLEVELAND 8, OHIO

Acme-Gridley Bar and Chucking Automatics, 1-4-6 and 8 Spindle—Hydraulic Thread Rolling Machines—Automatic Threading Dies and Taps—Limit, Motor Starter and Control Station Switches—Solenoids—Contract Manufacturing.



Sea water...secret of more steel!

THE secret of improved open hearth furnace bottom performance—and increased ingot production for you—is high purity periclase derived from sea water magnesia.

Higher in MgO, lower in impurities, this sea water *periclase* is the heart of Permanente 165 ramming mix.

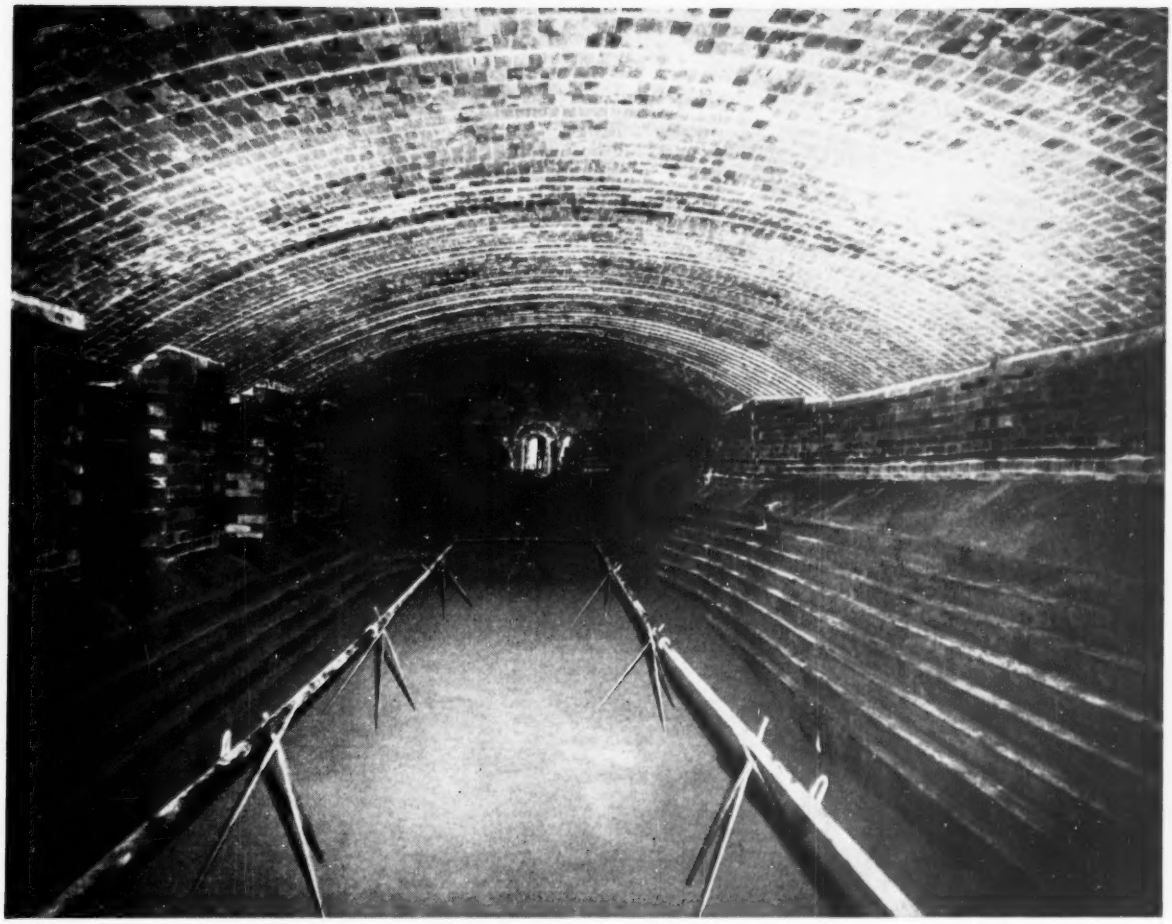
Proved superior by many of the industry's most progressive companies, Permanente 165 *retains highest strength at operating temperatures*—gives maximum refractoriness and maximum resistance to chemical attack.

Pre-shrunk for high density, the sea water periclase of patented Permanente 165 is bonded to *full depth* by crystal bridging—a solid phase reaction. *Result:* protection from costly breakthroughs, less down-time for repairs between heats, more tonnage per year!

YOUR Kaiser refractory engineer will give prompt attention to your refractory problem—will offer, where desired, research, design and installation service to give you maximum production most economically. Write for descriptive literature on (1) Permanente 165, (2) the companion ramming mix, Permanente 84, and (3) Permanente Refractory Brick. Principal sales offices: *Chemical Division*, Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, California. First National Tower, Akron 8, Ohio.

Kaiser Chemicals

Basic Refractory Brick and Ramming Materials



Better brick...another secret of more steel!

THE PROVED SUPERIORITY of Permanente Basic Brick is the result of more than 10 years experience in producing basic brick specifically designed to give you better performance.

Many of the nation's largest steel producers rely on Permanente Basic Brick to give them longer life in service, less downtime for replacement and repair, and higher tonnages. Among its quality advantages are:

• *Pre-shrunk, accurately-sized periclase grains derived from sea-water magnesia* • Ceramic bond achieved through solid phase reaction; no appreciable liquids at operating temperatures • High refractoriness • Maximum density • Resistant to slag attack • High hot load strength • Maximum resistance to abrasion • Superior spall resistance • Great volume stability • Clean edges; accurate dimensions.

PERMANENTE REFRACTORY BRICK

PA (Permanente Periclase "A") brick burned for open hearth and electric furnace bottoms. Low in iron, chrome free, maximum MgO in bottom.

PCA, PCA-MC (Permanente Periclase-Chrome "A") brick, plain and metal-encased for open hearth end walls, front walls and uptakes. Metal-encased for electric furnace sidewalls. High in MgO. Outstanding all-purpose refractory.

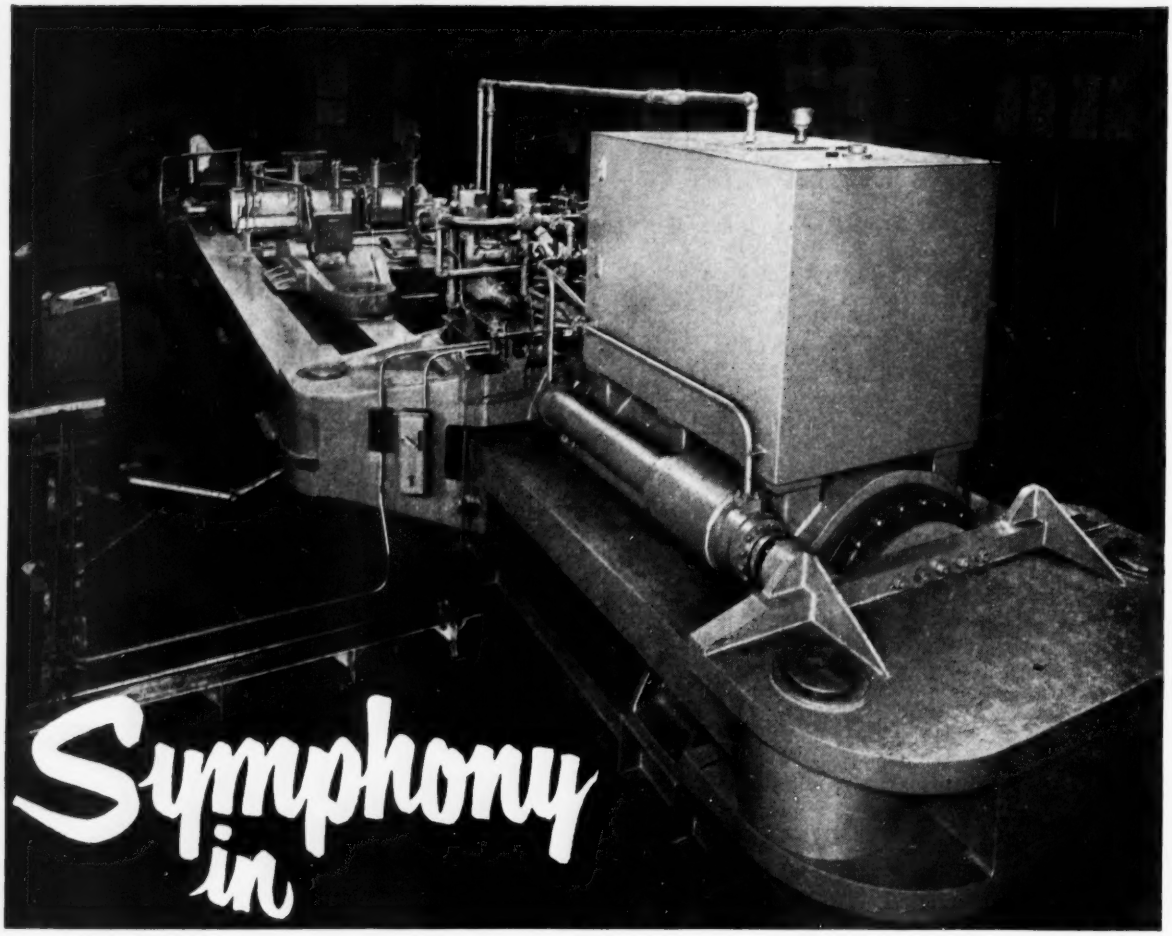
CPA (Permanente Chrome-Periclase "A") brick, burned for open hearth front and back walls. Controlled chrome additives result in highest resistance to spalling.

CPA-MC (Permanente Chrome-Periclase "A") brick, metal-encased for open hearth back walls, front walls. D (Permanente Chrome "D"), burned open hearth bottoms. High hot load strength.

Installation service at no extra cost.

Producers of the Most Complete Line of Basic Refractories

Dolomite • Magnesia • Magnesite • Alumina • Periclase



Steel

The giant machines that master tough metals are not usually quiet workers. Steel . . . iron . . . bronze . . . the many alloys—the casual visitor in a metalworking plant hears their voices as a discordant chorus. But to the man who knows modern machinery and its work, their sound is part of the great symphony of American industrial achievement.

Many of the precise and powerful special machines that play an important part in this "symphony in steel" have been built in the Sun Ship plant. Clients who need special machinery—of which the 2000-ton hydraulic metal stretcher machine shown above is a good example—have learned that Sun Ship's various shops and facilities are designed and coordinated to do special machinery-building jobs with precision and speed . . . and they turn out machines with the same fine qualities.

The men and management at Sun Ship are fittingly proud that their ability in plate work, fabrication and machinery building has contributed for years to the efficiency of many great plants and industries engaged in building a greater America.

Sun

SHIPBUILDING & DRY DOCK COMPANY

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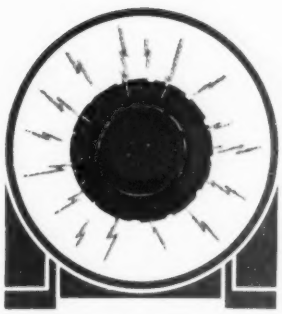
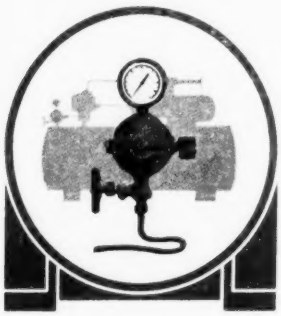
25 BROADWAY • NEW YORK CITY

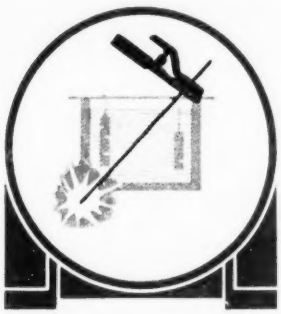
Refrigeration & Air Conditioning



Electrical Generation



Air Compressing



D. C. Generation

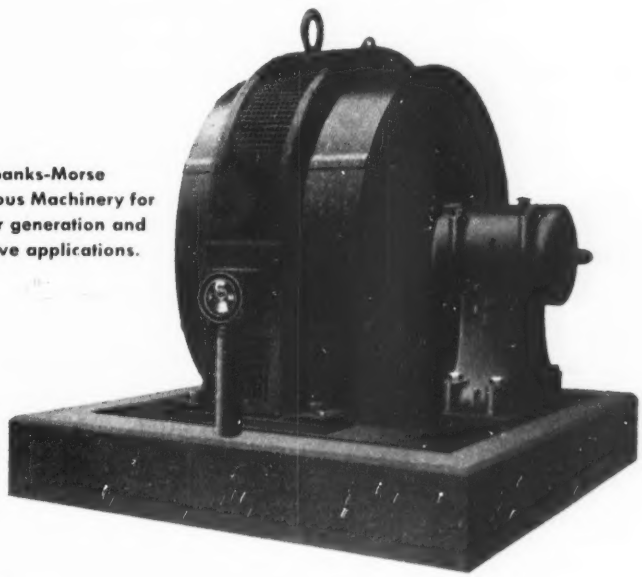
Paper Processing

Electric Motors

for every industry

When you need electric motors . . . in any rating, or frame type . . . one or a thousand . . . *always* look for the Fairbanks-Morse Seal. For over 120 years it has stood for the finest in manufacturing integrity to *all* industry.

Fairbanks, Morse & Co., Chicago 5, Illinois.

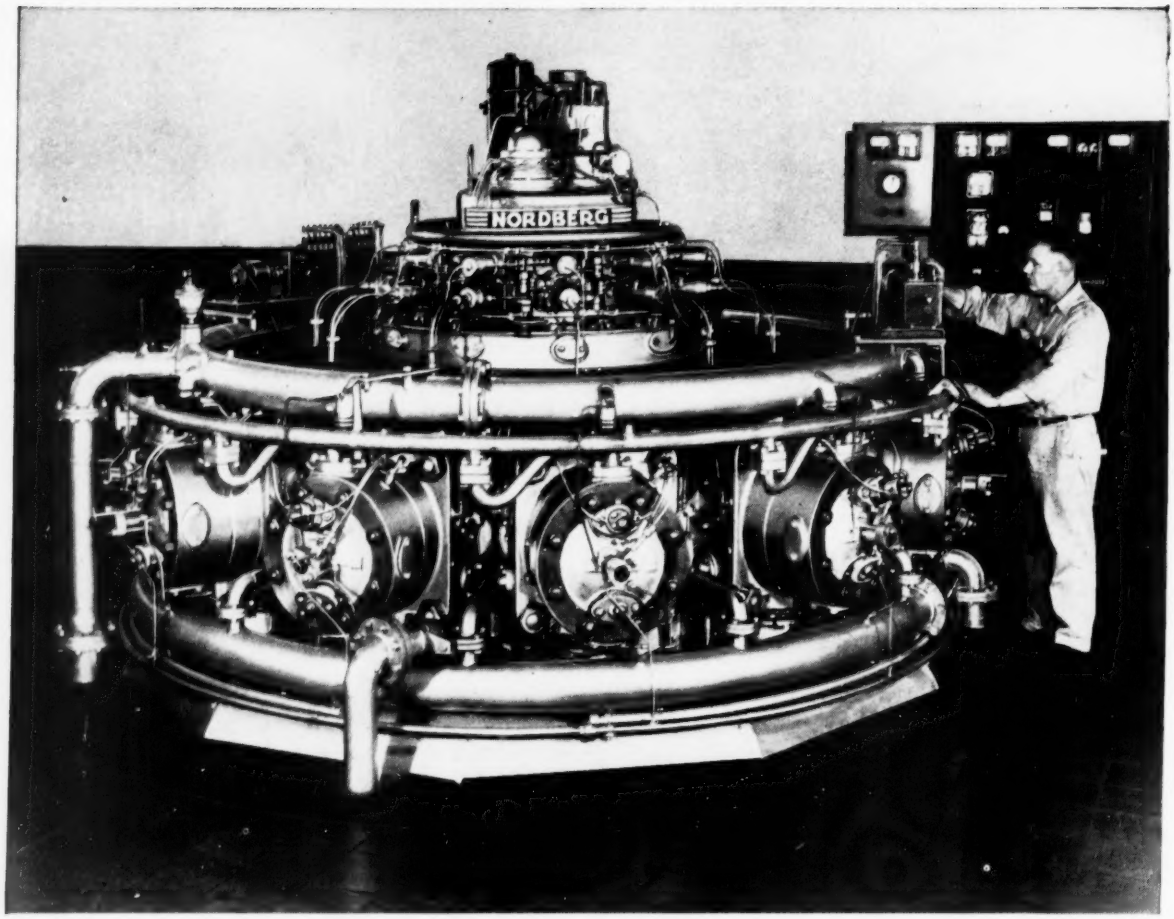


Fairbanks-Morse Synchronous Machinery for all power generation and large drive applications.

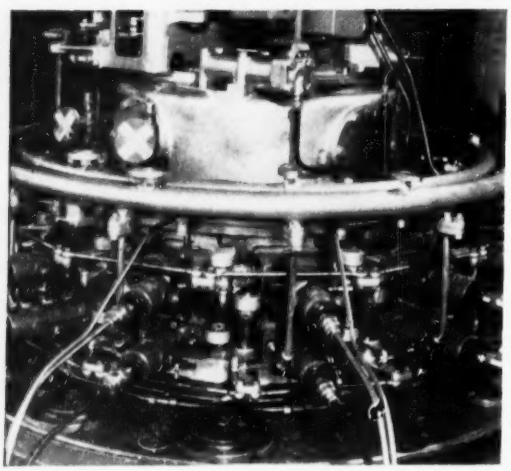
FAIRBANKS-MORSE

a name worth remembering when you want the best

ELECTRIC MOTORS AND GENERATORS • DIESEL LOCOMOTIVES AND ENGINES • RAIL CARS • PUMPS • SCALES • HOME WATER SERVICE EQUIPMENT • FARM MACHINERY • MAGNETOS



Here's Why The Nordberg Manufacturing Co. Uses *Summerill* Seamless Tubing



This close-up of the Nordberg two-cycle Radial Duafuel engine shows ½" O.D. Summerill Tubing being used for the fuel oil and gas lines. . . a .107" I.D. fuel oil pump line . . . and a .187 I.D. gas actuator pump line.

"For many years, we've used Summerill Cold Drawn Seamless Tubing in our Radial engine oil and/or gas fuel lines. It has been our experience that Summerill constantly maintains the high standard of quality required for our products."

This report from the Nordberg Manufacturing Co., Milwaukee, Wis., is typical of the results that hundreds of other Summerill customers have achieved. And we're ready to prove that you'll benefit in the same way, thanks to the exacting quality-control we exert at every step of production, from selection of prime raw materials to shipment of the finished product to you. ● Why not get together with us on your tubing problems? We'll gladly work with you to improve your product, reduce costs and eliminate fabrication difficulties. *Call or write today!* Summerill Tubing Co. Div., Columbia Steel & Shafting Co., Pittsburgh 30, Pennsylvania.

Summerill

"TRICLENE" D

(TRICHLORETHYLENE)

—the modern degreasing solvent

Made by Du Pont • Pioneer Manufacturer of Degreasing Fluids

Ever since Du Pont chemists first developed synthetic solvents for vapor degreasing, they have worked to provide industry with the best possible product. Today's "Triclene" D is just that—the most effective degreasing solvent Du Pont has ever produced. This rugged solvent incorporates *all* the advantages of over 20 years' technical and practical experience.

"Triclene" D is now successfully used in thousands of plants. It thoroughly removes most of the stubborn buffing compounds, greases and lubricating oils . . . assures excellent results even in high-speed operations. And with "Triclene" D goes expert technical assistance from Du Pont and your local distributor. For this friendly service, simply write: E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.

DISTRICT OFFICES: Boston • Charlotte • Chicago • Cincinnati Cleveland • Detroit • El Monte (Calif.) • New York • Philadelphia

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SEND IN THIS COUPON FOR FREE BOOKLETS

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Please send me the literature checked below:

- ☐ "How trichlorethylene is used in metal cleaning".
- ☐ "Triclene" D — an improved vapor degreasing solvent.
- ☐ "Metal degreasing — standard practices."
- ☐ Du Pont publication, "MODERN METAL FINISHING". (Please add my name to the mailing list).

NAME ..... POSITION .....
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You can make high quality welds, quickly and easily, in stainless, aluminum, cast iron, HASTELLOY and MULTIMET alloys—practically all commercial metals—at lower cost with the 300 amp. HELIARC HW-10 water-cooled torch.

You'll find that the improved water-cooling system assures cooler and more effective operation even when the torch is used continuously at the full rated capacity. The cooling water flows through the power cable and torch body down to the water jacket and gas cup. The return flow follows the same route in reverse. All exterior "plumbing" has been eliminated allowing more maneuverability and preventing leakage due to accidental damage. Water-cooling makes lightweight torch construction possible, and because the power cable is also water-cooled, it too, is lightweight and easy to handle.

The HW-10 was designed so that the water passages are accessible and easily cleaned.

Electrodes are easily adjusted on the HW-10. A quarter turn of the torch cap releases the electrode for adjustment or replacement. You need no wrenches or other tools. In addition, electrode stub loss is reduced by placing the water-cooled electrode holder much closer to the arc.

Are you getting the best possible results from your present welding apparatus? Developments in the inert gas welding field have been so great and have come so rapidly that torches over four or five years old are now obsolete. Be sure that you have the highest production at the lowest cost. Modernize with the 300 amp. HELIARC welding torch.

Your local LINDE representative would be happy to give you more detailed information on the HELIARC HW-10.

"Heliarc," "Hastelloy," "Linde," and "Multimet" are registered trade-marks of Union Carbide and Carbon Corporation.

Linde
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Specific steels

YOUNGSTOWN

Cold Finished

CARBON AND ALLOY STEEL BARS

Uniformly satisfactory in service because—

Machinability is outstanding

Tolerances are uniformly close

Metallurgical characteristics are rigidly controlled

QUALITY YOUNGSTOWN SERVICE

FOR TOP QUALITY BARS

●ALL steel for Youngstown Cold Finished Bars is of predetermined analysis—produced in the open hearth by closely controlled blending and refining of raw materials. Rigid control from ore to finished product results in uniform dependability.

Youngstown Cold Finished Carbon and Alloy Steel Bars are furnished in standard shapes and sizes, in either coils or straight lengths. For further information, phone or write our nearest District Sales Office.

Youngstown

COLD FINISHED CARBON AND ALLOY STEEL BARS

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel

General Offices: Youngstown, Ohio - Export Office: 500 Fifth Avenue, New York 36, N. Y.

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Story of a Reliefer that became the No. 1 Starter

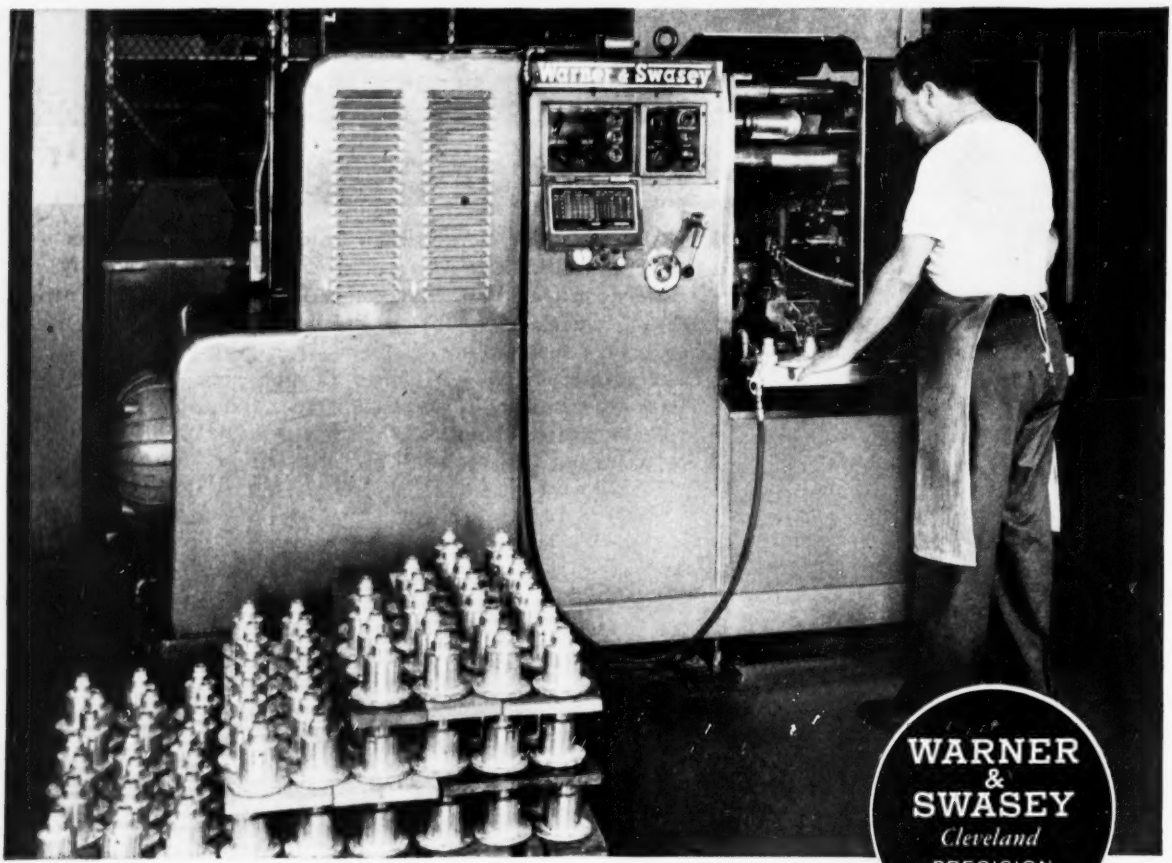
IT CAN HAPPEN with machines as well as men. Ask the Powers Regulator Company of Skokie, Ill. —manufacturer of automatic temperature and humidity control systems.

Powers Regulator, like many companies these days, was faced with the necessity of increasing production of a battery of turret lathes, some of which needed replacement. They also wanted to call in some of their subcontracted work. So they bought a Warner & Swasey 1 AC Single Spindle Automatic to help take the pressure off their hand-operated machines.

This company soon discovered that they had never fully realized the tremendous work potential of the 1 AC. It kept taking over more and more turret lathe work—increasing the production on some of the more complex pieces as much as three times. So the company scheduled the 1 AC for additional shifts—still more work.

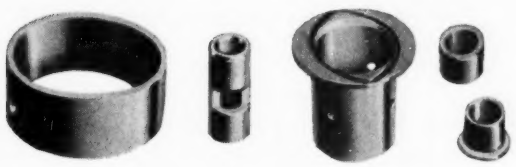
Today the machine is running three 8-hour shifts, 6 days a week. It has eased the load on the turret lathes—and the company has recovered work previously subcontracted. They now have another 1 AC on order.

This story is not unusual. The 1 AC's quick setup and extreme accuracy make it ideal for increasing production on many turret lathe jobs—while requiring less skilled operators. And its advantages as an automatic cuts costs on short and long run jobs. But find out how the 1 AC will boost profits in your plant—call in our nearest Field Engineer for all the facts.



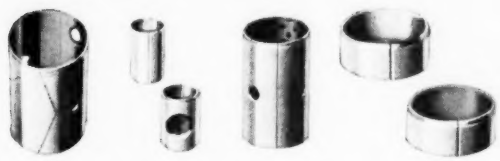
YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY

Sleeve bearings in a wide variety of designs and sizes



Cast bronze bushings

Precision bronze parts



Bi-metal split bushings

Rolled split bushings

Washers

Spacer tubes

research • engineering
quality control

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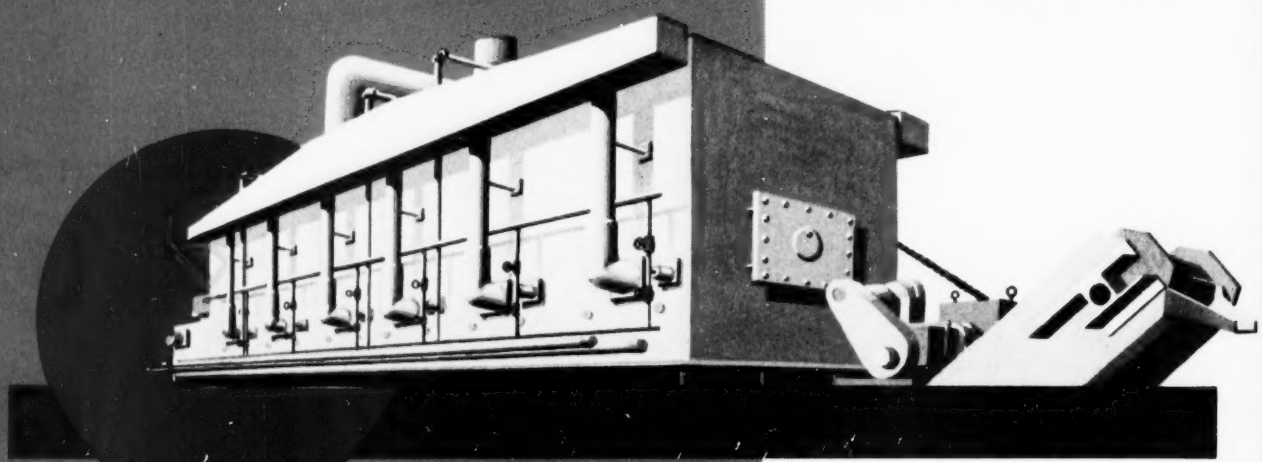
Since **FEDERAL-MOGUL** *1889*

Salem-Brosius has a bad habit

that means profit to you!

Salem-Brosius has the unfortunate habit of going to the extra trouble of engineering more quality into its furnaces than the application might indicate. Unfortunate for Salem-Brosius, but fortunate for you. Prices being equal, you, as a customer, can hardly lose from an extra measure of good design and sturdy construction that assures you greater production, longer life, and easier operation.

Take the case of the controlled-atmosphere small-parts hardening furnace shown here, for which Salem-Brosius is justifiably well-known. Users find that fast precise heating, complete atmosphere control, and rapid and high capacity materials handling mean better production. Why not take advantage of our bad habit of extra quality. Send us an inquiry for this or any other type of heat-treating furnace now.



Controlled-atmosphere small-parts hardening furnace segment of a Salem-Brosius harden, quench and draw line.

SALEM-BROSIUS, INC.

Sales and Executive Offices: 248 Fourth Avenue, Pittsburgh 22, Pa.

Are machine tool "tapeworms" eating up your maintenance dollars?

Don't tear the hide off your plant engineer every time maintenance costs surge high. Check into your machine tools *first*. Chances are that "tapeworms" lurk deep inside their gizzards—draining your plant production system, eating up your maintenance dollars.

Extricate machine tool "tapeworms" with Engineered Rebuilding

Factory Magazine reports that two out of every five plants review their equipment. It's the first step towards rebuilding. It's the only way to pinpoint your troubles, halt breakdowns of machinery that account for so much of your downtime, wipe out uncountable costs in repairs and new equipment.

Break down your maintenance costs by machine tools

Factory says this is being done today by three out of ten plants, indicating it has a lot of value. Obviously, there's still plenty of by-guess-and-by-gosh among the other plants. If you ever want to isolate this major drain on your maintenance budget, *now is the time to start*.

Report those progress checks

Top management needs this information to pull a machine tool for rebuilding *when the tool needs it—before the heavy expense starts.*

Exactly what is Simmons Engineered Rebuilding?

It's *complete* rebuilding and modernization "from the ground up." It includes dismantling down to main castings, thorough cleaning, testing of all bearings, replacement of worn parts, rewiring of electrical circuits... plus the introduction of up-to-the-minute features that enable the machine to operate at an even *higher* capacity than when it was brand new. The rebuilt and modernized machine tool is "witness-tested" on the Simmons plant floor. A Simmons service engineer checks its performance with your inspector under actual working conditions; OK's it only if its productive capacity equals or exceeds its original capacity when new.

Simmons Engineered Rebuilding delivers *guaranteed* satisfaction, delivers it faster and at bigger money savings, especially on the larger-type tools.

Cut your maintenance costs with this simple plan:

1. On your next maintenance check, note especially those complex, hard-to-replace machine tools. Are they operating as well as they might?

2. If not, list the ones you can temporarily spare.

3. Send us this list of machines. We'll promptly quote prices and deliveries. And you'll receive our fact-packed periodical, THE SIMMONS WAY.

SIMMONS MACHINE TOOL CORPORATION
1755 North Broadway, Albany 1, New York
New York Office: 50 East 42nd Street
Phone in New York: MUrray Hill 2-5941
Phone in Philadelphia: VIctor 8-3133
Phone in Pittsburgh: PEnhurst 1-3700

NEW Thomas electro lead alloy coated strip steel solders readily, resists corrosion, fabricates easily

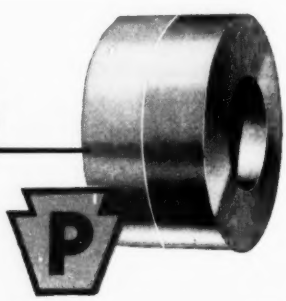
The newest addition to the Thomas family of pre-coated steels—*electro-plated lead alloy cold rolled strip steel*—gives you another method of improving your products and reducing your costs. The homogeneous and dense lead-tin alloy coating provides excellent resistance to corrosion, improves the soldering and spot welding qualities of the strip.

The ease with which Thomas Electro-coated lead alloy can be soldered without an acid flux and with a minimum consumption of solder is a distinct advantage to the fabricator. It retains its solderability over a considerable period of time. The coating also provides an excellent base for paints and synthetic enamels and acts as a lubricant in drawing operations.

Thomas Electro-coated lead alloy is available in the gauge range of .005 to .050 up to 20″ in width. For information on this new product and the other economical Thomas pre-coated steels listed below, write today.

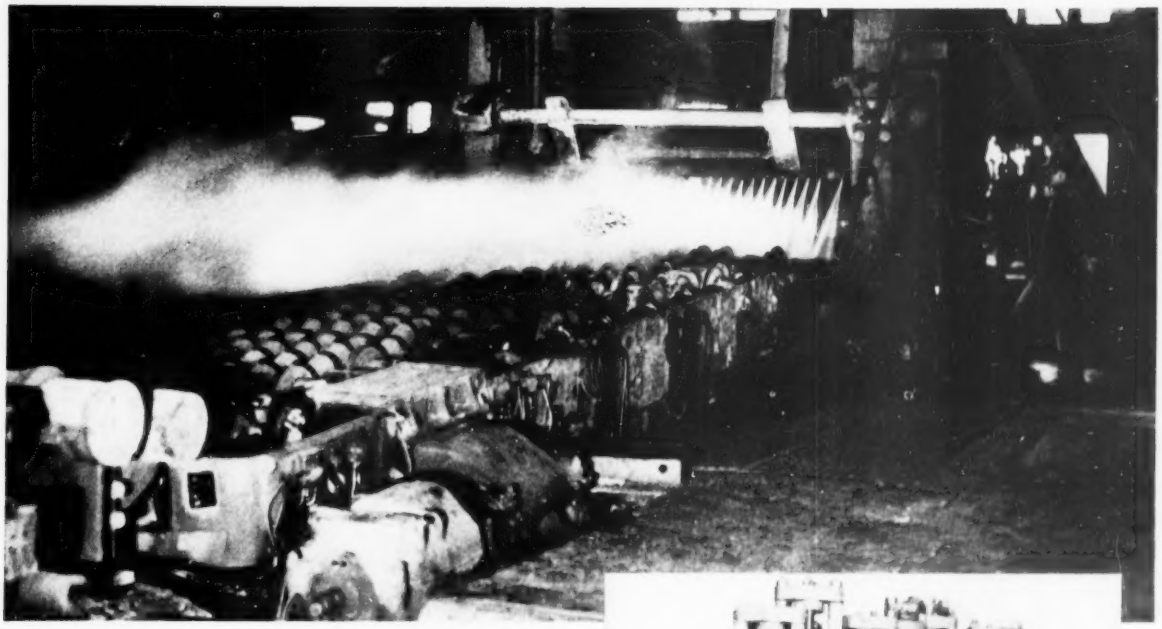
Cold-rolled strip steel electrolytically pre-coated with Zinc, Copper, Brass, Nickel and Lead-Alloy in Natural, Planished and Buffed Finishes—Hot Dip Tin and Lead-Alloy Coated—Lacquer Coated in Colors—Annealed Spring Steel—Alloy Strip Steel—Uncoated Strip Steel. Carefully produced to your specifications.

Thomas Strip



Thomas Strip Division

Pittsburgh Steel Company • Warren, Ohio



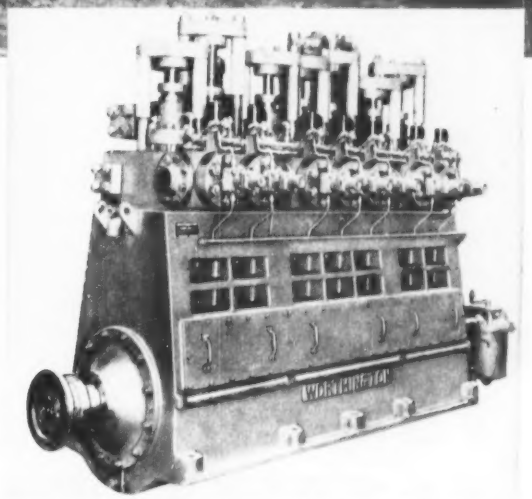
High-pressure water descales thousands of tons of steel daily

It takes vast quantities of high-pressure water to remove the scale from steel sheets, plates and billets going through rolling mills like the one shown above.

To deliver high-pressure water for this kind of work, more and more leading names in industry are specifying Worthington heavy-duty multi-plunger power pumps. Here are some of the reasons why:

Worthington's patented synchronized suction-valve unloading allows delivery to start or stop as often as you want, quickly but gradually, without any shock or disturbance.

Ceramic plungers, optional on all of Worthington's power pumps, are precision-made for complete and easy interchangeability. As hard as tungsten carbide, these plungers resist corrosion, abrasion and breakage.



WORTHINGTON HEAVY-DUTY MULTI-PLUNGER POWER PUMPS deliver high-pressure water for use in hydraulic descaling system in this rolling mill. These rugged pumps are also used in hydraulic press work, foundry cleaning systems, hydrostatic testing and high-pressure process pumping.

Individual valve-hole covers permit quick and easy access for valve maintenance without disturbing piping.

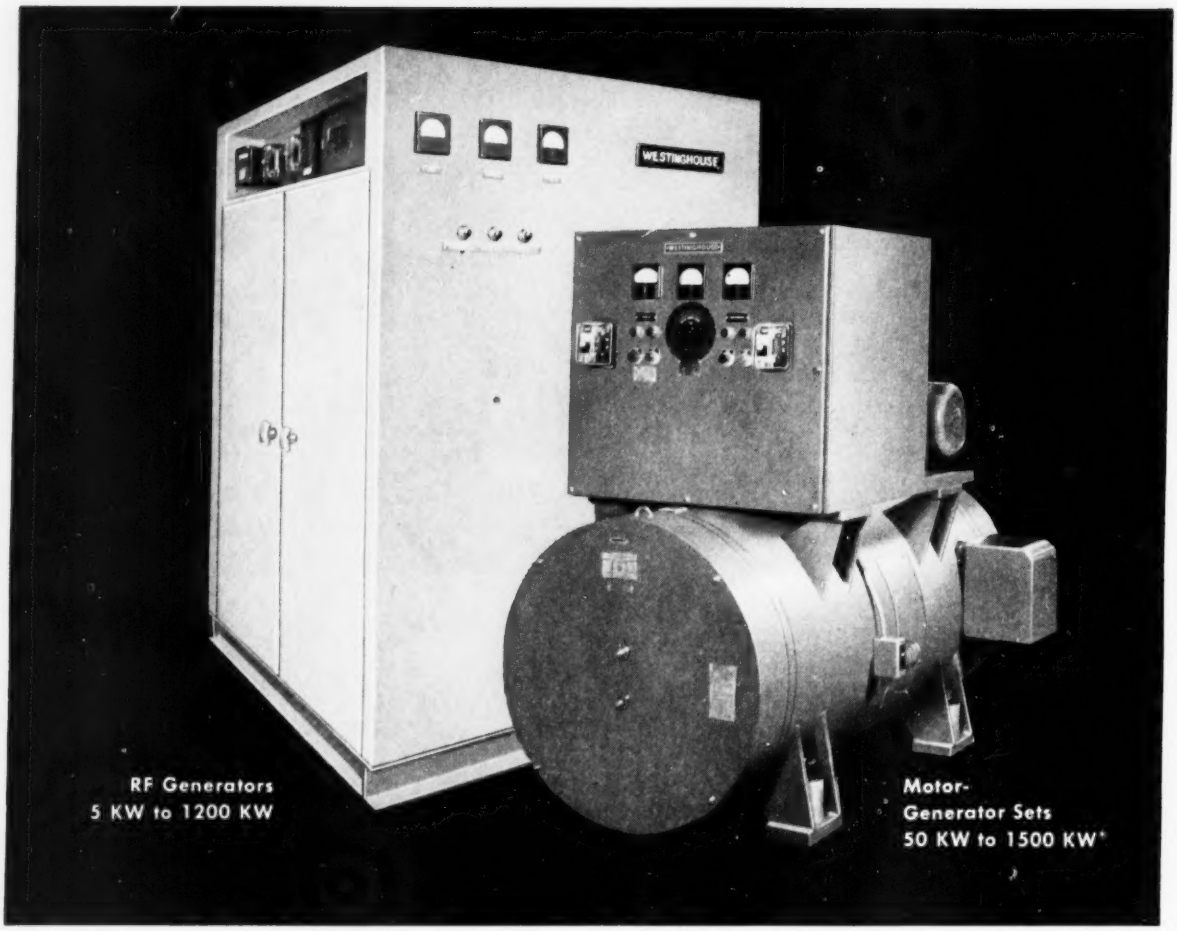
Get all the facts about these dependable, long-lived pumps. Write for the free Power Pump Bulletin, W-415-B1, to Worthington Corporation, Reciprocating Pump Division, Harrison, N. J.

P-3-6

The World's Broadest Line Assures You the Right Pump for Every Job

WORTHINGTON

Power Pumps



FOR INDUCTION HEATING— SPECIFY WESTINGHOUSE

Leader for Years in Total KW in Use—Years of experience gained by Westinghouse from hundreds of induction heating installations throughout industry can be applied now to your own heat-treating needs. You are assured of reliability — proved by the fact that the total kilowatt-hours generated by installed Westinghouse induction heating equipment has exceeded, year in year out, that of any other manufacturer.

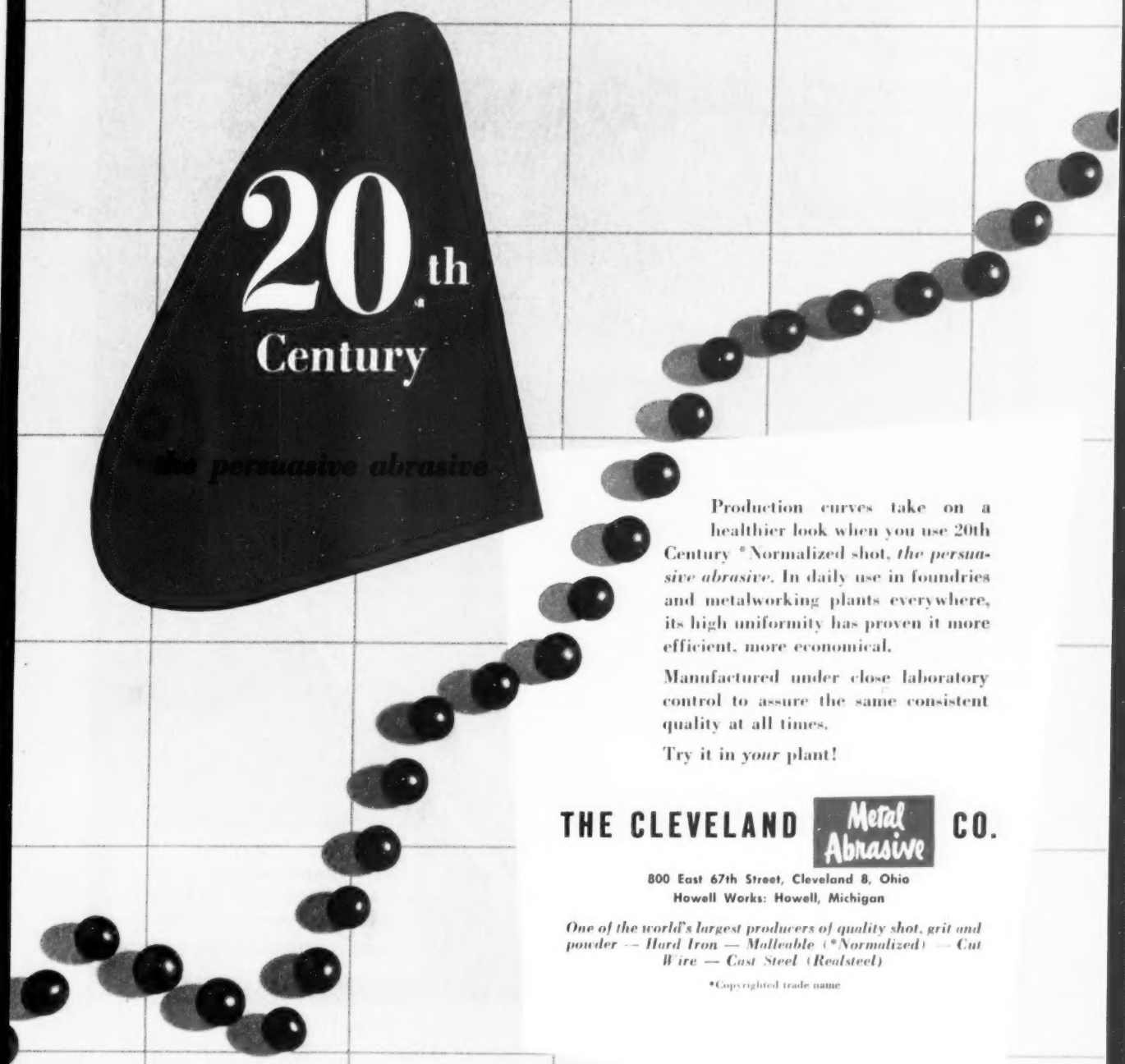
And you know that Westinghouse, as a manufacturer of both motor-generator and radio-frequency-generator induction heating units, is in a position to recommend equipment without bias for your specific requirements. Whatever your heat-treating problem, inquire about these efficient, versatile tools now. Call your Westinghouse representative or write: Westinghouse Electric Corporation, Electronics Division, Induction Heating Section, 2519 Wilkens Avenue, Baltimore 3, Maryland.

**Higher ratings can be supplied for any specific purpose.*

J-02271

YOU CAN BE SURE...IF IT'S

Westinghouse



Production curves take on a healthier look when you use 20th Century *Normalized shot, *the persuasive abrasive*. In daily use in foundries and metalworking plants everywhere, its high uniformity has proven it more efficient, more economical.

Manufactured under close laboratory control to assure the same consistent quality at all times.

Try it in *your* plant!

THE CLEVELAND Metal Abrasive CO.

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*One of the world's largest producers of quality shot, grit and powder — Hard Iron — Malleable (*Normalized) — Cut Wire — Cast Steel (Realsteel)*

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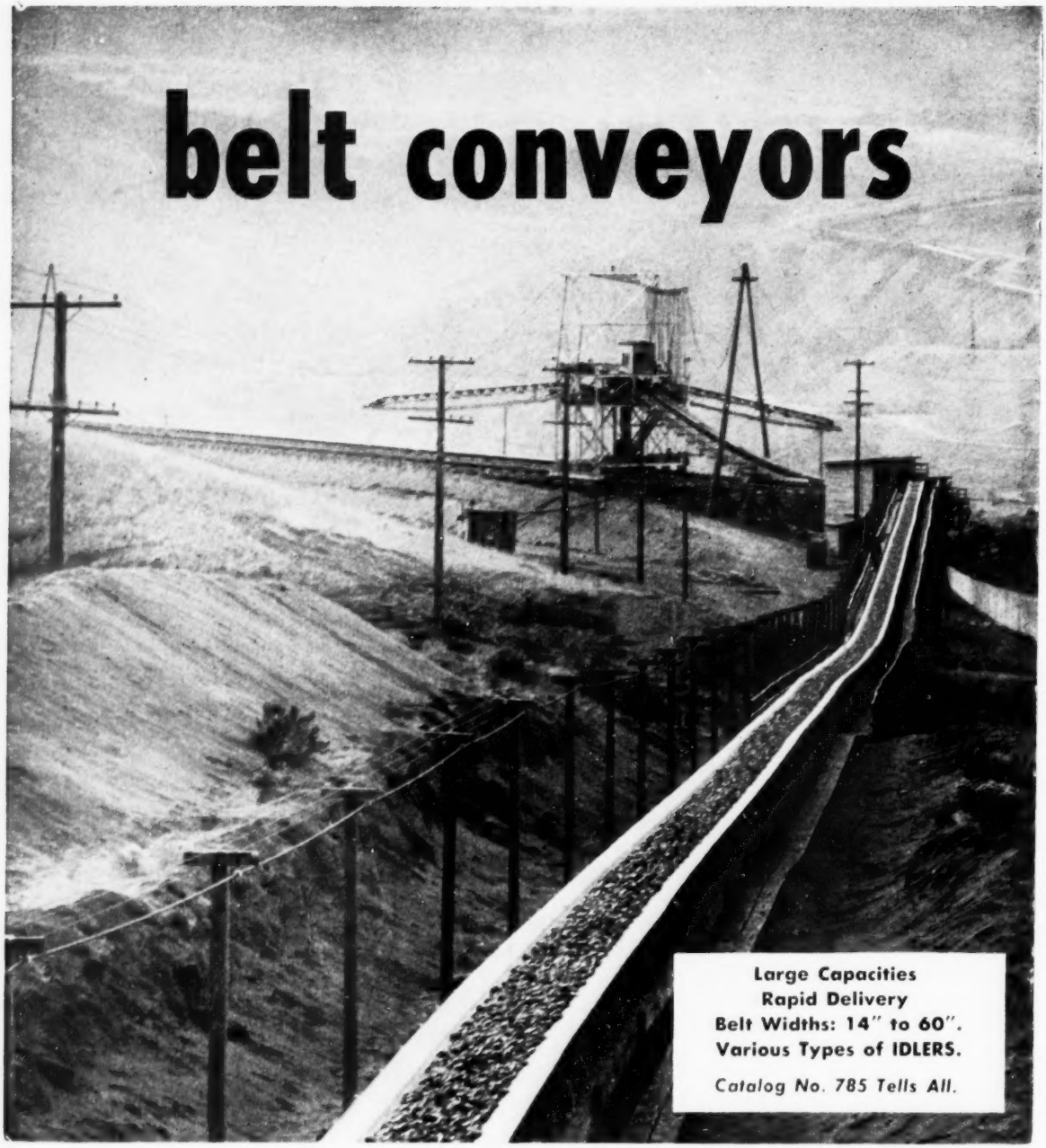

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IF IT'S MINED, PROCESSED OR MOVED

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Packed in Bags and Shipped on Pallets

Each bag holds 25 lb. of contained vanadium, so additions can be made without weighing. Bags prevent contamination and are shipped on pallets for easy and economical handling.

Use this New, Easy Method

. . . FOR ADDITIONS OF VANADIUM

You can handle additions of vanadium conveniently and economically with ELECTROMET ferrovanadium packed in bags.

Check these advantages:

- ***Convenient Packaging***—The alloy is packed in strong five-ply, paper bags. These bags have a wide blue band across the middle, as well as blue edges and bottom, for positive identification. The bags prevent contamination and preclude any chance of mix up with other alloys.
- ***No Weighing***—Each bag (25 lb. of contained vanadium) can be added without weighing.
- ***Handling Costs Reduced***—Pallet shipments are available at no extra charge. Each pallet holds about 4,000 lb. of ferrovanadium—2,200 lb. of contained vanadium. Pallets can be conveniently unloaded and handled in your plant by lift truck or overhead crane. Handling costs are reduced and inventory-taking is simplified. And you don't have to return the pallets.
- ***High-Quality Material for Every Need***—ELECTROMET ferrovanadium is uniform in analysis, closely graded, correctly sized, and physically clean. It is furnished in four grades:

	Vanadium	Silicon max.	Carbon max.
High-Speed Grade	50 to 55%	1.50%	0.20%
Special Grade	50 to 55%	2%	0.50%
Open-Hearth Grade	50 to 55%	8%	3%
Foundry Grade	50 to 55%	approx. 10%	3%

✻ **Immediate Delivery**—Vanadium is readily available and can frequently be used in engineering steels to replace part, if not all, of certain scarcer alloys.

✻ **Engineering Service**—Our staff of experienced metallurgical engineers is always ready to furnish technical assistance in the use of vanadium. Phone, wire, or write one of ELECTROMET's offices for additional information.

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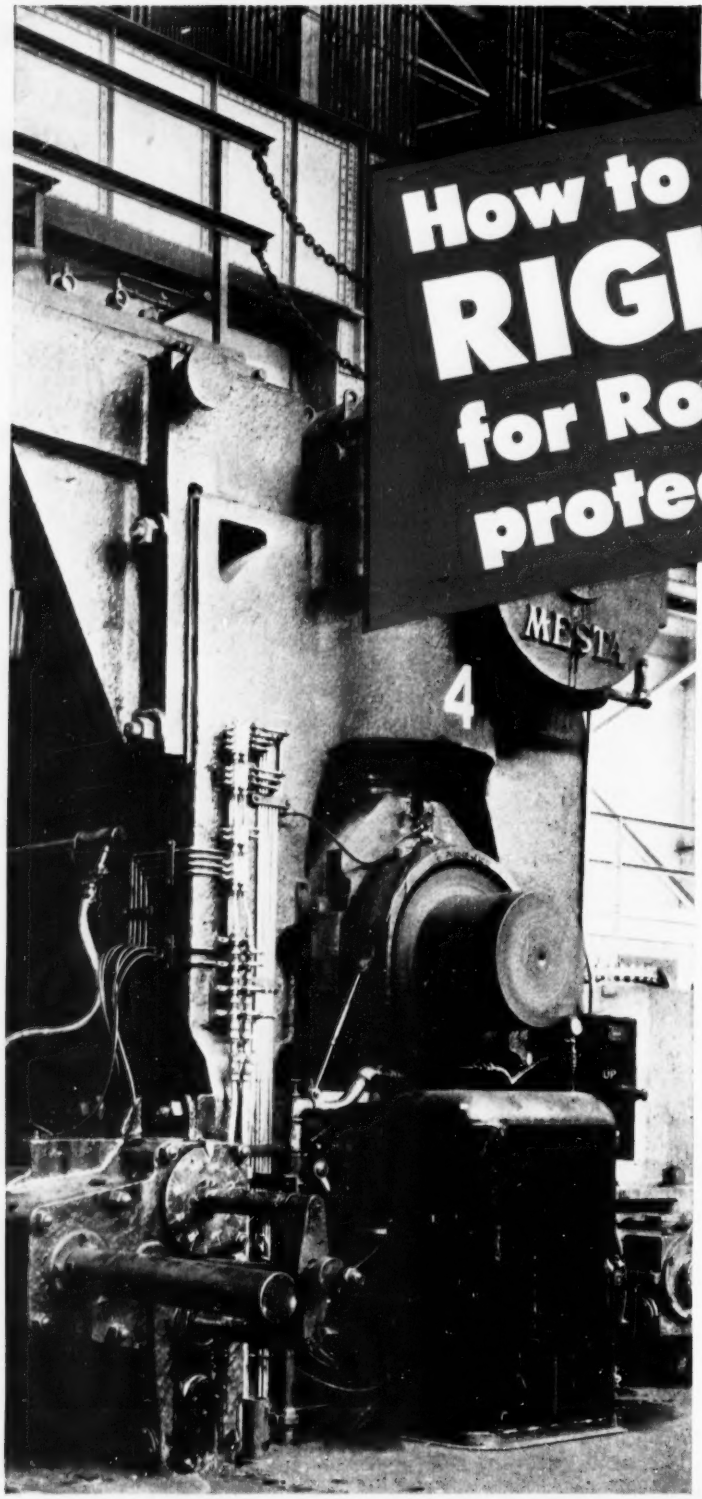


How to select the RIGHT OIL for Roll Neck protection...

For the oil circulating systems of your roll stands, choose an oil that has high resistance to emulsification, oxidation and sludging. *Texaco Regal Oil* is turbine-quality oil with both these needed characteristics — and *more*.

Texaco Regal Oil separates rapidly from water that may work its way past the seals. This, in conjunction with its high resistance to oxidation, assures that bearings will stay clean and lines clear — free from sludge. *Texaco Regal Oil* thus keeps bearings fully lubricated. Roll necks roll on a film that stands up under the severest conditions. You benefit through smoother operation, longer bearing life, lower maintenance costs.

For your enclosed reduction gears, use *Texaco Meropa Lubricant* — noted for its EP stability, its resistance to oxidation, thickening and foaming.

Let a Texaco Lubrication Engineer help you improve machinery performance and reduce costs throughout your mill. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Regal Oils

(HEAVY CIRCULATING OILS)

STEEL
August 10, 1953

Metalworking Outlook

Coming Up: Tax Reform

The big objective of the next regular session of Congress convening Jan. 6 will be tax reform. For corporations, the legislators will let the excess profits tax die, enact more liberal provisions for depreciation allowances, force the abolition or modification of section 102 of the Internal Revenue Code, which is a standing threat to tax accumulated earnings and profits, and seek to simplify U. S. tax laws.

No Special Session of Congress

September tax collections will determine whether Congress is to be called into extra session in the fall to increase the legal limit on the public debt. The prospects now: No special session will be necessary. The most important aspect of the seven-month meeting just ended for the 83rd Congress was that it served as a proving ground on which the Eisenhower administration policies were tested. From industry's standpoint, the most important action was the extension of the excess profits tax to Dec. 31, 1953, and passage of the defense budget of $34.4 billion.

Two Trends in Labor

The two most important trends in labor negotiations that have developed this year are: Wage increases are getting smaller and greater proportionate increases have been going to skilled workers. The Associated Industries of Cleveland reports its 1953 weighted average for pay increases in the Cleveland area is currently 6.98 cents, excluding fringes. That compares with 11.75 cents in 1952 and 7.48 cents in 1951. Indicative of the other trend is the General Electric Co. settlement which ranged from $3\frac{1}{2}$ cents to $15\frac{1}{2}$ cents, depending on the classification of skill. Until recently the trend had been for flat, across-the-board raises regardless of skills.

NLRB Works Faster

Watch for continued speedup by the National Labor Relations Board in handling cases. It has especially cut down the time in deciding disputed representation cases and contested unfair labor practice cases and hastened the machinery in its general counsel's office. NLRB recognizes the need for still greater speed, because it believes that "labor-management frictions are like fires, in that the sooner the fireman can come the smaller the blaze will be."

AEC: Big Builder

By early 1954 atomic construction will reach about $130 million a month, around 5 per cent of estimated total construction expenditures in the U. S. Present atomic building projects account for some 3 per cent of all building

Technical Outlook—p. 95 The Market Outlook—p. 153

outlays. And the prospect is for more construction of private projects. Atomic Energy Commission says it hopes to propose legislation by the end of this year to permit the industrial development of atomic power.

Savings in Ammunition

Reduced consumption of ammunition promises to be the major saving in military hard goods consumption coming as a result of the Korean truce. The consumption of ammunition in Korea has been at the rate of around $100 million a month. Some $200 million annually will still be spent on ammunition because of the need for replenishing stocks of certain items.

More Aircraft in 1953

The U. S. aircraft industry will continue to produce military planes during the next 12 months at a rate of 1000 to 1100 per month. That's almost five times the rate of June, 1950, when the Korean war began. Aircraft Industries Association of America estimates that the industry will ship $820 million worth of planes to foreign nations in 1953, more than at any time since the end of World War II. Bulk of the exports will be military craft.

Foreign Lead, Zinc Subsidies?

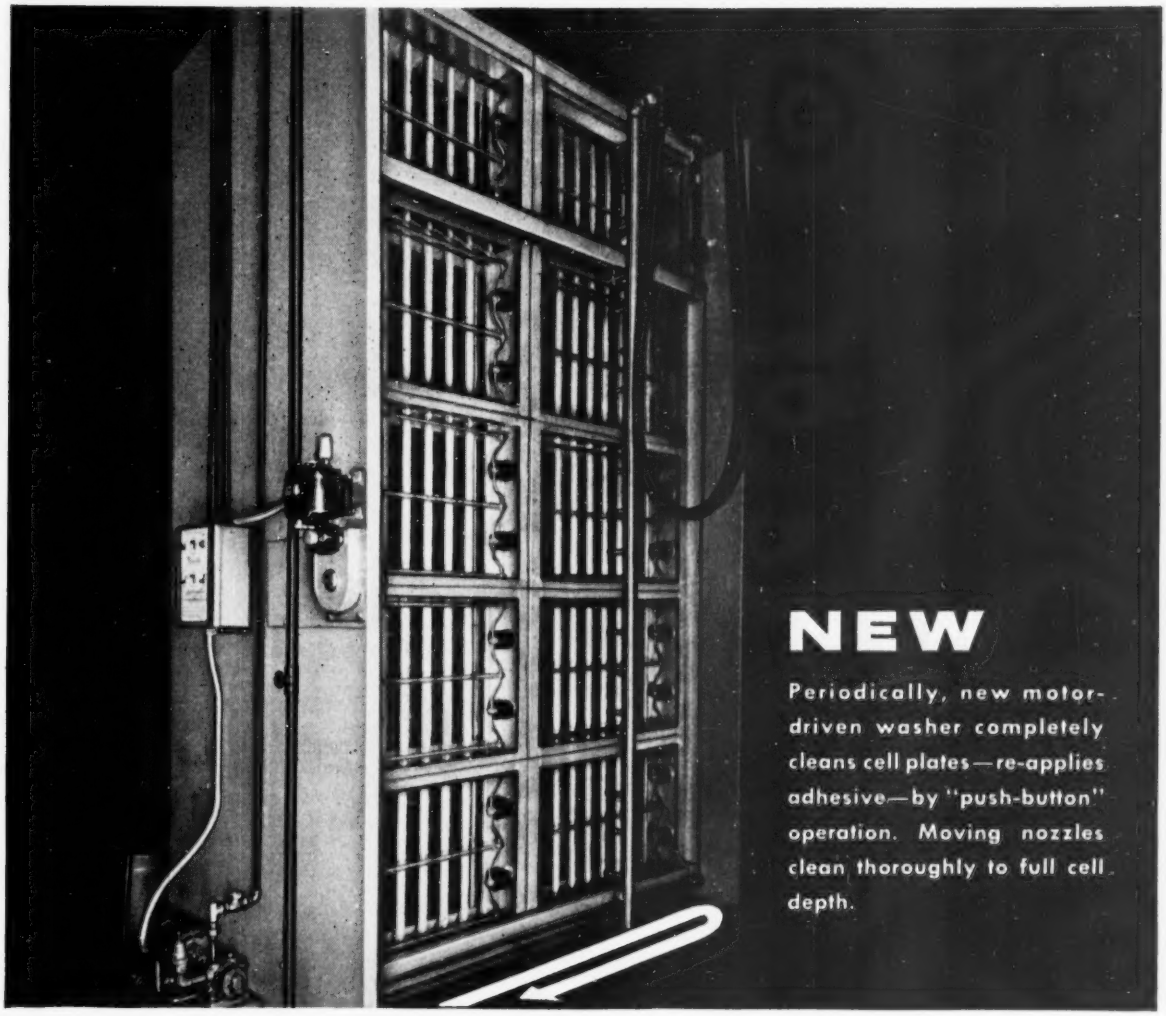
Seven House members have asked the House Small Business Committee to investigate what they term government subsidies for foreign producers of lead and zinc. They charge the Defense Materials Procurement Agency with having negotiated lead and zinc contracts abroad at a figure "well above the market price." The Senate Finance Committee has also requested the Tariff Commission to submit by next Mar. 31 a report on the effect of lead and zinc imports on domestic mining industries.

Straws in the Wind

American Car & Foundry Co. is voluntarily refunding $22.5 million to the Ordnance Corps as a result of more maunfacturing efficiency in production of self-propelled vehicles . . . A shortage of aluminized picture tubes is developing in the TV industry . . . National Production Authority is still functioning on an interim basis until the Commerce department's new Business Services Administration can get organized . . . Federal Waterways Corp., a new subsidiary of St. Louis Shipbuilding & Steel Co., St. Louis, has purchased the government barge lines.

This Week in Metalworking

More freight absorption in steel is a possibility (p. 53) . . . President Eisenhower is preparing to outline his views on Taft-Hartley changes (p. 54) . . . Auto replacement parts should reach $2.3 billion in 1953 (p. 55) . . . A sampling of metalworking first-half reports shows that most have improved sales and earnings (p. 56) . . . Screw machine parts makers foresee good 1953 business, but a gradual decline starting now and lasting until the second half of 1955 (p. 57) . . . Crane Co.'s Cramet Inc. subsidiary will produce titanium sponge (p. 58) . . . Tool and die makers have heavy civilian backlogs (p. 65).



NEW

Periodically, new motor-driven washer completely cleans cell plates—re-applies adhesive—by "push-button" operation. Moving nozzles clean thoroughly to full cell depth.

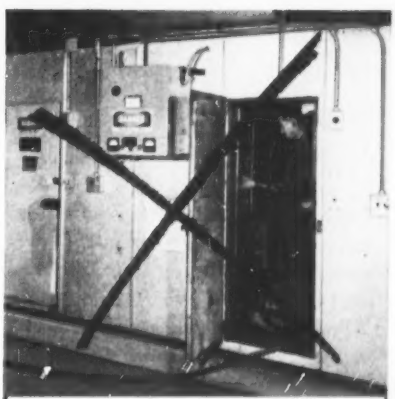
NOW—"PUSH-BUTTON" WASHING FOR ELECTRONIC AIR CLEANER

Now, a new, low-cost, automatic PRECIPITRON® washer cuts maintenance costs and eliminates unpleasant inside-the-duct washing of cells.

This unique device features moving nozzles, making PRECIPITRON the easiest electronic air cleaner to service. After thoroughly cleaning the plates, the washer re-applies adhesive. Entire operation is under "push-button" control. Laboratory and field tests have proved that moving-nozzle washing is a "must" for proper cleaning.

Type PX PRECIPITRON, the electronic air cleaner, traps microscopic airborne particles of dirt, dust, grime and pollen which would pass through conventional filters. It fits into any heating, ventilating or air conditioning ductwork.

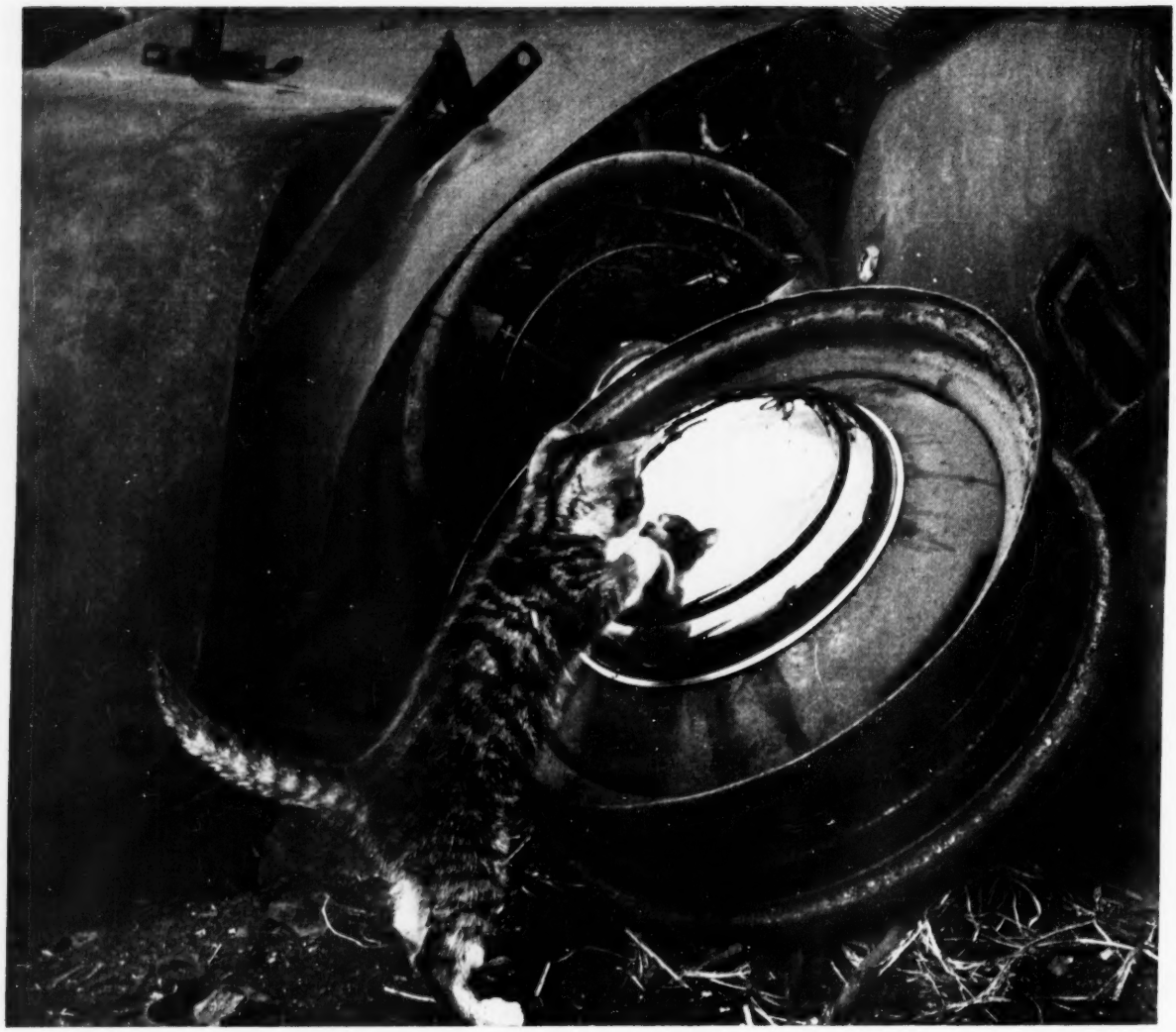
Learn how PRECIPITRON will keep the air in your building dirt-free at negligible cost. Call your local Westinghouse-Sturtevant office, or write: Westinghouse Electric Corporation, Sturtevant Division, Hyde Park, Boston 36, Massachusetts.



Maintenance men no longer need to enter enclosure to clean PRECIPITRONS. New "push-button" feature does away with hot, wet tasks.

WESTINGHOUSE AIR HANDLING

YOU CAN BE SURE ... IF IT'S Westinghouse J-80231



It's still good to look at... after 12 years

Twelve years' exposure to road grime and chemicals haven't dimmed the luster of this chromium stainless steel hubcap.

Found in a field of worn-out automobiles, the hubcap was washed to remove grease and grime. The surface came out bright as a mirror—and as beautiful as ever. It is a good example of the durability of this corrosion-resisting steel.

You can give *your* products the lasting beauty of Armco Stainless Steel today. Armco 17 (Type 430) is available without government restrictions. This chromium grade is one of the oldest of the standard types of stainless steels. It has an excellent record of service in a wide variety of uses.

Where your products or equipment are subjected to severe corrosive conditions, chromium-nickel types of stainless may be needed for complete protection. NPA regulations permit the use of these grades in many important applications.

WRITE FOR BOOKLET

Write for our new catalog titled, "Armco Stainless Steels." It contains full information about all the Armco grades, including extra-low carbon and precipitation-hardening types.

ARMCO STEEL CORPORATION

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ARMCO

First Things First

Now that we have a truce in Korea, unsatisfactory though it may be, the next step would seem to be to try to utilize it as a stepping stone to enduring peace, not only in Asia but throughout the world. This will be difficult even under the most favorable circumstances and it may prove to be impossible. Nevertheless, it is incumbent upon the United States, as a leading nation, to try.

In any attempts we may make to achieve peace, we must take into account some factors we have either ignored or underrated in everything we have done since the end of World War II. Looking back over the postwar period of eight years, it seems quite clear that we have been so obsessed with the idea that the chief hindrance to peace is the difference in ideologies between the Soviets and the western nations that we have overlooked other factors which are of tremendous importance.

For instance, isn't it likely that we have been placing so much emphasis upon the type or form of government under which people live that we have been overlooking a factor which to tens of millions of individuals all over the world is infinitely more important?

That factor is the economic well-being of the individual, the family unit, the community, the political state and the world. At one time it was possible to have a reasonable degree of peace throughout the world when some peoples were prosperous and others were impoverished. That era has passed. Today communications are such that universal peace cannot be achieved as long as violent contrasts in the economic status of the world's population exist.

In line with this thinking, have we given enough attention to repairing the damage to world trade that was caused by World War II? Are we giving enough thought to what a return to a free flow of goods throughout all parts of the world would do to the morale of people on both sides of the iron curtain?

Not until man has enough bread to banish hunger does he begin to think about the kind of government under which he lives.

T. L. Shaner

EDITOR-IN-CHIEF

POIGNANT TAFT STORY: Nat Howard, editor of the *Cleveland News*, tells a touching story of the late Sen. Robert A. Taft. On the afternoon before Christmas in 1947, the senator and members of his staff were busy trying to clear up odds and ends before the holiday. He planned to catch a 5:20 p.m. train for Cincinnati which would give him from 8 a.m.

to 6 p.m. at home with his invalid wife. At 5 o'clock he said abstractedly, "Well, that's that" and left. The staff was stunned. A girl said, "Why, he didn't even wish us Merry Christmas."

One of Taft's senior assistants caught him on the steps of the Senate Office Building and told him of his oversight. "Gee, you're right," he said. He returned to the office, shook hands all around, wished everybody a Merry Christmas and—missed his train. The next train left at midnight. Taft dined alone in the station restaurant. He sat on a hard station bench reading a paper-cover detective story until he could get into his sleeping car at 11 o'clock. This would get him into Cincinnati at noon. He would have only five hours at home on Christmas day instead of ten.

Few persons realize the extent to which truly great men sometimes punish themselves in order to do the right thing.

* * *

HARDER WAY IS BETTER: At the tail end of the first session of the 83rd Congress, the Eisenhower administration asked its members to authorize the raising of the limit on the national debt from $275 billion to $290 billion. The House acquiesced promptly but the Senate finance committee turned thumbs down on it.

Time alone will tell whether this last minute turn-down was the best answer to the debt-limitation problem. We are inclined to favor it as an intermediate step. To boost the debt limit this early in the game would smack too much of the "easy-way-out" policy which prevailed through most of the Roosevelt-Truman regime. Let's try a harder way, even if it hurts temporarily!

* * *

SALES POTENTIAL GOOD: In view of everything that has been said and written about the possibility of reducing costs by increasing the efficiency of handling materials, one would think that the market for materials handling equipment would be pretty well saturated. Therefore, it is something of a surprise to learn from a recent survey (p. 64) that only 49 per cent of all plants in the metalworking industry employing more than 20 persons are using power lift trucks for materials handling jobs.

It is significant that 98 per cent of the plants having more than 1000 employees use power lift trucks whereas only 32.5 of the plants employing from 20 to 99 persons use them. Considerable data resulting from the survey indicate that there still remains an attractive market for power lift trucks, particularly in smaller metalworking establishments.

* * *

APPRENTICE HARDSHIPS: American tool and die shops are confronted with the problem of a serious scarcity of skilled help. As a result (p. 65), most of them are operating on an unsatisfactory long one-shift basis simply because a second shift cannot be manned.

Recognizing this situation, the National Tool & Die Manufacturers Association is committed to a program of increasing apprentice training, but in this it encounters difficulties. Present standards call for four years of training before the apprentice becomes a journeyman. The temptation for an apprentice to jump to other lucrative jobs requiring shorter periods of training makes the job of finding and keeping apprentices for the full term a difficult one.

This problem of apprentice training is acute. It deserves much more attention than it is receiving.

* * *

ABOUT-FACE IN FTC: If all goes according to plan, on Sept. 25 John W. Gwynne, Republican, will succeed Stephen J. Spingarn, Democrat, as a Federal Trade Commissioner. This will give the Republicans a 3-2 majority in FTC and it will give Republican Chairman Edward F. Howrey a chance to put his ideas into effect. Prominent among his beliefs is this: "The right to meet a lower price which a competitor is offering to a customer, when this is done in good faith, is the essence of competition and must be permitted."

This would mean that at long last the controversial question about the legality of freight absorption would be settled, at least temporarily. The new-deal, fair-deal ban on freight absorption would be repealed. No return to multiple basing points is likely and even the absorption of freight costs will be resisted until the pressure of competition makes it expedient to employ it.

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...for maximum blocking efficiency

Characterized by freedom from impurities, uniform analysis and high density, Silblok 25 and Silblok 50 offer you maximum effectiveness in blocking open hearth and electric furnace heats.

They assure closer control of carbon content, help keep foreign inclusions to a minimum and start blocking action in the shortest possible time.

Silblok 25 and Silblok 50 contain nominal silicon contents of 25% and 50%, adjusted to give optimum results. Both alloys are carried in stock and supplied in sizes to meet customers' requirements.

Silblok 25 and 50 are among the complete family of Vancoram special and regular silicon alloys for use in the steel, iron, chemical and non-ferrous industries.

For complete information, contact your nearest Vanadium Corporation office.

Other Vancoram alloys for the iron and steel industries include a complete range of vanadium, titanium and chromium alloys, as well as a variety of special foundry alloys.

VANADIUM CORPORATION OF AMERICA

Producers of alloys, VANCORAM metals and chemicals

420 Lexington Avenue, New York 17, N. Y. CHICAGO • DETROIT • CLEVELAND • PITTSBURGH

Allegheny Stainless from Ryerson

Helps Make Your Milky Way

First rule at the vast Mars candy kitchens in Chicago is *cleanliness*. That's why gleaming, corrosion-resistant stainless steel is used abundantly in the making and handling of famous Mars confections. And prompt, personal service on Allegheny Stainless is provided by the nearby Ryerson Plant.

You'll find Ryerson a convenient source for stainless too, because Ryerson stainless stocks are the largest in the nation. If you want a straight chrome type, we have the widest selection. If you use chrome-nickel stainless, Ryerson is still your best source.

Ten types of stainless sheets are on hand. Pipe and tubing—more than 260 miles of it. Also stainless fittings and fastenings, bars, plates, etc. In aircraft quality stainless alone we carry more than 300 different items. And our stainless specialists are always ready to work with you on problems of application or fabrication.

You'll find beautiful Allegheny Stainless Steel easy to clean, easy to keep clean. It's the time-tested product of America's oldest stainless producer. So, call Ryerson—pioneer warehouse distributor of stainless—for all your requirements and count on us for fast service.

PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled and cold finished
STRUCTURALS—Channels, angles, beams, etc.
PLATES—Many types including Inland 4-Way Safety Plate
SHEETS—Hot and cold rolled, many types and coatings
TUBING—Seamless and welded, mechanical and boiler tubes
ALLOYS—Hot rolled, cold finished, heat treated. Also tool steel
STAINLESS—Allegheny bars, plates, sheets, tubes, etc.
BABBITT—Five types, also Ryertex plastic bearings
MACHINERY & TOOLS—For metal fabrication

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Freight Absorption When... Where ?

IN MORE THAN ONE steel company's market research department, elaborate maps are being brought up to date at this minute to show, product-by-product, how the firm's freight rate situation compares with competitors'.

Why? Because more extensive freight absorption by steel companies is returning — not today or tomorrow, but fairly soon when competitive conditions warrant it.

History—The steel industry absorbed some $65 million in freight charges yearly until 1949 when confusion over the legality of the practice forced it to switch to f.o.b. pricing, with the buyer picking up the transportation tab. Although U. S. Steel Corp. and a few other producers are still leery about legal aspects of the matter, many executives now believe that absorption will get an O.K. from the Federal Trade Commission. They predict a more extensive practice of freight absorption as competition for business increases. The question is not, will there be freight absorption, but when and where will it occur.

While many concede that absorption will return, no one contacted in a STEEL survey believes that we will ever go back to the old multiple basing point system. What's more, most agree that absorption will be far more limited than before.

When? — Actually, freight absorption is going on now. Jones & Laughlin Steel Corp., for example, has been absorbing on wire rope and electric weld tubing. Freight is reportedly being absorbed on pig iron in the South. Some premium-price producers have been absorbing on their general line, but they are cutting their base prices more frequently than they are paying the freight.

So, the actual tonnage on which freight is being absorbed by steel firms today is small. When more extensive absorption does come, it will be practiced on a product-by-product basis. That will be usually determined when orders for a particular item are below 65-75 per cent of capacity for the product or when a competitor's inroads into the market on a particular product threatens to drop operations below 65-75 per cent. No major producer is down that low and probably none will be for the rest of this year. But on some products, it's possible that the 65-75 per cent level will be reached early next year. Then those market maps will get more use.

Where? — When the time does come for freight absorption, it will probably come first in a battle over New England, Eastern seaboard and Detroit markets. Even with a $2 premium currently on its products, the Fairless Works at Morrisville, Pa., will give U. S. Steel a freight advantage in all but the southern tip of New Jersey, in a small section of eastern Pennsylvania, and an edge in southeastern New York state, and in all of Connecticut, Rhode Island, most of Massachusetts and a part of New Hampshire and Maine. Bethlehem Steel Co.'s Lackawanna, N. Y., plant will help curb the scope of the Fairless freight advantage in New England and the greater portion of New York state. Fairless will be at a freight disadvantage throughout Vermont, also in the northwest section of Massachusetts. Bethlehem's Sparrows Point, Md., plant will give it a freight advantage at Wilmington, Del., and Reading, Hazelton, Wilkes-Barre, Steelton, York, Harrisburg, Chambersburg and Williamsport, Pa.

U. S. Steel will drop its $2 premium before it has to absorb freight in the East, but both it and Bethlehem may eventually have to use absorption as a means to get business in the area. Even some Pittsburgh plants, if the going gets very rough, may be absorbing against Lackawanna for New England business and against Johnstown, Pa., output for Pennsylvania

and lower New York state volume.

Certainly, Pittsburgh area, Middletown and Youngstown mills will absorb early against Cleveland and Detroit area plants to keep their automotive customers in southern Michigan. Even Chicago producers may absorb eventually to keep the highly desirable auto business, but that will be a last-ditch stand because steel demand in the Chicago region now markedly exceeds capacity in the area. You can even expect absorption on the West Coast if conditions get bad. Although the demand still exceeds supply in many products in that sector, a demand-capacity balance has about been reached in such products as cold-finished bars and structurals. Watch for the possibility of absorption in those items.

Absorption Legal?—The consensus among lawyers currently is that freight absorption is legal under changed interpretations of the statutes now that the Republicans are in the saddle in Washington. On Sept. 25, John W. Gwynne, a Republican from Iowa, is expected to succeed Stephen J. Spingarn, a Democrat, as a Federal Trade Commissioner. Then, the balance of power on the commission will shift 3-2 in favor of the Republicans. Then, Chairman Edward F. Howrey, a Republican, can implement his policy. He has already stated he believes that "the right to meet a lower price which a competitor is offering to a customer, when this is done in good faith, is the essence of competition and must be permitted." In other words, he would approve freight absorption. He has already stated in writing that he supports S. 1377, a bill introduced by Sen. Homer Capehart (Rep., Ind.) which would write into law the principle that a seller may lower his price (absorb freight) to one customer to meet the price of a competitor, without violating the Robinson-Patman Act.

Mr. Howrey already has persuaded a majority on the commission that Congress should be urged to pass a law clarifying the confusion on freight absorption. Unfortunately, Congress adjourned last week without doing so. While the need for such clarification is not so pressing at the moment because the FTC, as it will soon be constituted, favors absorption, the commission's views may change again. Congressional leaders interviewed by STEEL agree that clarifying statutes are needed. Watch for action when Congress convenes again next January.

Reluctant Move—Naturally, the steel industry is reluctant to absorb freight extensively. The $65 million annual transport bill it has paid in the past as a result of the practice could be even higher today because freight rates have risen 15 per cent since 1949. And there's no likelihood of lower freight charges soon. The Interstate Commerce Commission has extended until Dec. 31, 1955, the 15 per cent freight rate increase put into effect in April, 1952.

What's more, the steel industry's profit ratio has fallen since it last absorbed freight extensively, in 1949. While the situation improved a little in the first half of this year, net profit per dollar of sales was 7.99 cents in 1950, 5.71 cents in 1951 and 4.91 cents in 1952. A heavy debt burden has also been added by the steel industry because by the end of the year it will have spent some $3.7 billion on expansion since the Korean war started in June, 1950.

But despite those problems, steel companies eventually will absorb some freight—as a last ditch move to hold business.

Taft-Hartley Again

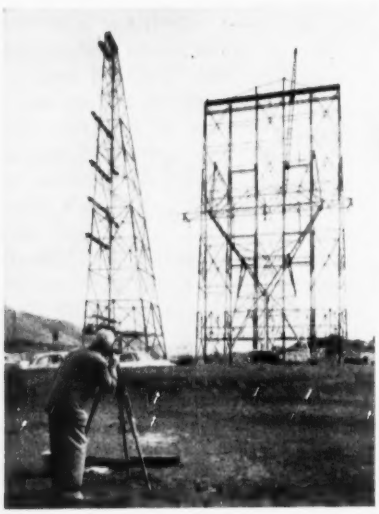
The President may soon state his views on T-H Act changes. Here is what they are

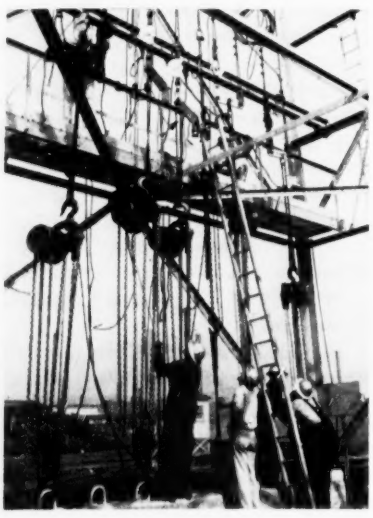
PRESIDENT EISENHOWER shortly may make a public statement on the administration's attitude on Taft-Hartley Act amendments, as a preliminary to addressing a message on this subject to the next session of Congress. While the administration has drafted proposed changes in the act, White House Press Secretary James Hagerty said the draft is "preliminary" and "not even approaching the final stage." The draft, as it now stands, reportedly includes these proposals:

Exempt smaller employers having little effect on interstate commerce.

Relieve unions from responsibility, solely on the basis of membership, for one member's actions.

Permit unions to oust and require employers to fire employees under a union shop who have sub-





Weights and Cables Prove Tower's Toughness

Loaded and pulled to the breaking point, a 350-KV steel transmission tower of new design undergoes strenuous testing at Bethlehem Pacific Coast Steel Corp.'s tower fabricating shop in South San Francisco, Calif. Bethlehem Pacific is building 1050 of the towers for the Bonneville Power Administration. A transit, left, checks deflection. Right, loads are applied by chain blocks

versive leanings or divulge confidential union information.

Declassify as supervisors those who do not substantially represent management.

Permit broader hiring through unions.

Permit company-union bargaining to give unions a bigger voice in hiring practices.

Allow pre-hire arrangements between employer and union and permit a seven-day union shop membership requirement in construction and other fields of temporary employment.

Eliminate the mandatory injunction against secondary boycotts and permit the latter against construction projects.

Shorten the contract termination notice period from 60 to 30 days and eliminate the loss of status penalty for employees who strike during that period.

Prohibit a representation election before four months after any strike begins.

Eliminate de-authorization but not de-certification elections.

Eliminate the provision authorizing state right-to-work laws, make the federal law paramount and fix a new boundary between federal and state jurisdiction.

Let the checkoff remain valid until revoked by the employee.

And permit an employer voluntarily to waive participation in the administration of a union welfare fund to which he contributes.

Ford Offers Full Farm Line

The Ford Motor Co., one of the largest producers of farm tractors, is entering the farm machinery business on a wider scale. Henry Ford II said the company's farm equipment line will offer more than 100 major implements.

While Ford has built more than 2 million tractors since 1917, this is the first time a full line of agricultural equipment will be available. Included will be many ground-breaking implements, such as planters and cultivators, and larger equipment, such as combines, corn pickers, hay balers and cotton harvesters. Snow plows, post hole diggers, blades, scoops, saws and loaders will also be made.

NEA

Under Auto Hoods: Good Market Prospects

AUTO REPLACEMENT parts makers are viewing the record automobile production and sales much like the hometown barber sees the birth rate increase—more customers ahead.

Although 1953 first quarter figures indicate that replacement parts sales are slightly behind those of last year, the industry is expecting to maintain the $2.3 billion volume it had in 1952. This is a wholesale figure based on federal excise tax collections, but does not include tax free items like tires, radios, etc. Record year for the industry was 1951 with $2.5 billion in sales.

Bumper to Dividend—The big years are expected just ahead. The bumper five and six million car-producing years since 1949 are about ready to set up dividends for the replacement parts makers.

"We used to think our biggest market was in cars two to five years old," a Cleveland wholesaler states, "but we've revised that to three to ten years. The cars five and six years old require the most parts replacements."

Bulk of the replacement parts sales is in motor parts, mufflers and tail pipes, spark plugs, and water and fuel pumps. Some replacement parts makers who also make original equipment are looking forward to the replacement business to take up slack in the expected car production slow-up.

Who Makes Them—Competition can also be expected to become more keen as the metals shortage continues to disappear allowing more producers into the market. Parts suppliers include the auto manufacturers, suppliers who make both original and replacement parts, and the independents who specialize in replacement parts.

Currently the motorist is able to take his car to the garage and get just about any part replacement he needs.

Military demands account for only a small percentage of the replacement parts market and little effect is expected in the industry even if orders are curtailed a bit.

More of an Ally—Junk and scrap yards which figure in the replacement business indirectly never were much of a factor in the over-all picture. In fact, as one wholesaler put it, "once they're in the parts business they get more and more calls for parts they can't supply from scrap. Then they become another outlet for us."

Add a million public-owned vehicles to the more than 52.6 million private automobiles, trucks, and busses on the highways today—all wearing out parts with each wheel revolution—and replacement parts makers can think of only one thing. Those old parts have to go.

Profits Rise Marks First Half Business

	Sales First Half		Earnings First Half	
	1953	1952	1953	1952
Affiliated Gas Equipment Inc.	$ 31,061,718	$ 22,895,752	$ 736,851	$ 439,039
American Brake Shoe Co.	74,531,459	73,918,104	2,792,847	2,664,364
American Locomotive Co.	205,709,348	194,904,026	3,148,574	3,832,057
American Machine & Metals Inc.	17,427,993	14,024,494	749,990	633,669
American Radiator & Standard Sanitary Corp.	140,824,000	123,966,000	6,412,373	5,158,795
Associated Spring Corp.	27,823,897	19,685,261	1,443,674	900,548
Baldwin-Lima-Hamilton Corp.	149,503,862	127,947,933	3,896,997	3,106,973
Blaw-Knox Co.	57,672,750	46,684,214	1,971,887	1,872,851
Bohn Aluminum & Brass Corp.	34,813,608	23,658,812	812,688	432,420
Caterpillar Tractor Co.	236,107,059	260,588,322	11,607,636	11,926,102
Clary Multiplier Corp.	7,500,000	7,000,000	215,000	175,300
Continental Can Co. Inc.	242,345,424	207,201,365	6,911,364	4,705,379
Elco Products Co.	27,010,071	19,570,562	1,991,229	1,355,942
Fairbanks, Morse & Co.	56,353,573	61,307,217	1,861,604	2,296,862
Fruehauf Trailer Co.	105,399,642	86,504,282	3,715,450	3,001,165
General Motors Corp.	5,440,545,856	3,863,560,341	312,845,787	296,048,085
General Time Corp.	22,708,711	16,272,960	943,045	701,711
Greenfield Tap & Die Corp.	9,546,869	9,468,206	467,524	458,676
Houdaille-Hershey Corp.	49,399,308	32,207,612	1,836,081	1,068,059
Koehring Co.	14,271,481	13,734,680	593,922	719,350
Mack Trucks Inc.	88,471,506	83,115,395	1,252,567	1,344,824
Manning, Maxwell & Moore Inc.	19,950,000	19,969,000	684,000	756,600
Monarch Machine Tool Co.	16,136,351	11,781,686	944,978	572,686
National Cash Register Co.	125,016,365	106,835,278	5,570,465	5,036,328
New York Air Brake Co.	20,308,985	18,688,681	1,091,389	1,024,790
Philco Corp.	238,522,000	165,156,000	12,216,000	4,289,000
Republic Aviation Corp.	188,299,571	134,526,855	3,739,300	2,626,225
Rheem Manufacturing Co.	94,200,000	59,827,000	2,775,632	1,517,938
Rockwell Manufacturing Co.	40,449,000	45,464,000	2,354,000	3,106,000
Scovill Manufacturing Co.	67,964,111	58,454,298	2,280,240	1,933,605
Simonds Saw & Steel Co.	20,799,679	18,063,537	1,317,888	1,078,386
Standard Forgings Corp.	12,077,849	12,653,088	449,771	358,111
Standard Steel Spring Co.	85,588,610	77,944,904	3,518,633	3,053,017
Thompson Products Inc.	169,416,436	12,407,127	5,357,618	3,813,962
Towmotor Corp.	11,701,764	16,129,820	494,197	729,625
United-Carr Fastener Corp.	26,458,560	20,051,051	1,276,490	1,038,284
United Engineering & Foundry Co.	39,974,547	42,544,934	2,043,709	1,933,587
United States Pipe & Foundry Co.	45,882,573	43,259,041	3,729,321	2,006,687
Westinghouse Air Brake Co.	69,305,948	45,312,680	4,916,847	5,393,536
Westinghouse Electric Corp.	780,489,000	681,378,000	35,660,000	31,507,000

METALWORKING'S sales and earnings for first half, 1953, made a strong increase over last year, based on the accompanying representative sampling.

Of that sampling, 90 per cent of the companies increased their sales volume; 80 per cent increased their earnings after taxes. Earnings among these firms were up 18 per cent from the first half of 1952. Of course, this is only a sampling and percentage gains will undoubtedly vary when figures from the bulk of metalworking companies still to report come in.

The Point—But the point is there: Sales and earnings were up appreciably for most metalworking firms in the first half.

Behind the rise in sales is the absence of a steel strike this year. Although some forms of steel remained difficult to obtain, supplies generally were satisfactory and getting better. Plants were able to operate at optimum rates; customers were still to be had without too much strain.

Cost Reduction—Healthy operating rates coupled with increased plant efficiency and other cost reduction efforts swelled profits more than sales. In fact, a few companies raised earnings on smaller sales such as United Engineering & Foundry Co. which noted a 6 per cent drop in net sales with a 17 per cent rise in net income after taxes.

Most companies which commented on their first half showing said they could have done better but for two reasons: Labor costs rose during the half, following generally the pattern of the steel wage settlement last year; and steel price increases hurt profits where steel was a major raw material.

Stopper on Profits—Among the minority of metalworking companies which showed a decline in first half earnings, one thing stood out: Profits tumbled when the production line was stopped for any reason such as strikes, changeovers or supply difficulties. A few companies reported cutbacks in defense contracts hurt their profit showing.

Private Electric Income Is Up

Net income for the nation's privately owned electric utility industry was up 16.3 per cent to $947,094,000 in 1952, the Federal Power Commission reports.

Total operating revenue amounted to $6,549,164,000, an increase of 8.1 per cent over 1951.

Government Patents Listed

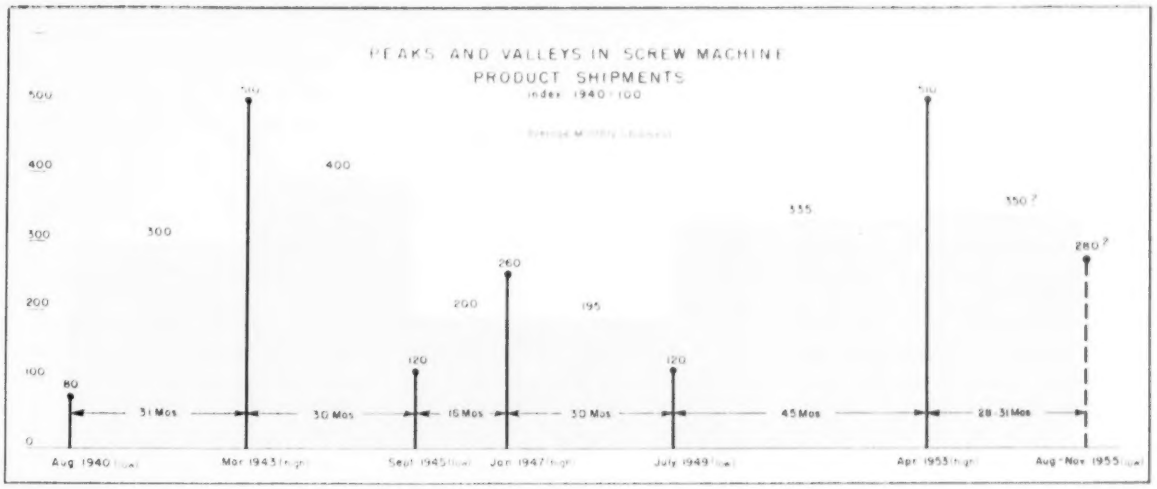
A new book entitled "Government Owned Inventions Available for License" has been published by the Department of Commerce in co-operation with the Government Patents Board.

The book makes available in practical form information relating to 3658 government-owned patents ordinarily available to the public on a nonexclusive, royalty-free license basis.

Purpose is to encourage industry, particularly smaller plants, to make greater productive use of scientific and technological advances brought about by government-financed research. It is hoped, according to Dr. Archie M. Palmer, chairman of the Government Patents Board, that the book "may also be a stimulating and diversified source of new ideas leading to the solution of research and manufacturing problems."

Oil Expansion Plans Continue

Oil operators laid 9355 miles of crude and products pipelines and completed storage projects with a capacity of 35,365,218 barrels from July, 1952, to July, 1953, the Petroleum Administration for Defense reports.



Is Business Turning Downward?

Figures for the bellwether screw machine products industry indicate that it is. But 1953 volume will still be high; the long-term decline into 1955 won't be severe

"OUR FIGURES indicate that we started on a long-term business decline in May that will reach a bottom sometime from August to November, 1955."

So says Orrin B. Werntz, executive secretary of National Screw Machine Products Association, Cleveland. His figures, above, refer to shipments by the screw machine products industry. Statistics studied were submitted before the Korean truce.

Argument — Some economists don't put much stock in cyclical trends. Others do. Whatever your position, you will be wise in examing NSMPA statistics because:

1. The figures are good, based on a consistent 10 per cent sampling of the industry over the years.

2. They show a reasonably uniform cycle of activity in the industry.

3. Screw machine product output reflects activity for industry generally because screw parts are used as components by virtually every segment of metalworking.

A review of NSMPA shipment figures for the past 13½ years indicates this: Starting in August, 1940, from a low of 80, the index hit a peak in March, 1943, at 510, slid to a low in September, 1945, at 120, peaked in January, 1947, at 260, bottomed again in July, 1949, at 120 and peaked again in April, 1953, at 510.

Reservations—Although NSMPA figures are not adjusted for seasonal fluctuations or inflated prices, they do mirror accurately general trends in business over the past 13 years. The NSMPA bottom in July, 1949, for example, almost exactly coincides with the low point in the general recession of 1949. The peaks in 1943 and 1947 also match general industry experience, and the 1953 high point promises to parallel that in all metalworking when complete figures are in. NSMPA reports shipments since April have declined only slightly, but with new orders dropping, the association believes April will prove to be the top.

While the Mt. Everest and Death Valley appearance of the screw products trend looks disheartening, all is not as bad as it seems. The highs and lows are often reached quickly in a final four to six-month move. Also, average shipments within the move are good, as opposed to the total swing (see the table).

Still Good—In fact, the association estimates that because of the running start in the first half the 1953 business for the 1500 companies in the industry will hit $450 million, higher than either 1952 or 1951, and compared to $71 million in 1938. Even from now until the next bottom, predicted in 1955, average monthly shipments should be only about 10 to 15 per cent under the expected 1953 average.

NSMPA's past figures are based on actual facts; it makes no claims that its predictions for the future are anything but educated guesses. But it has enough confidence in those guesses to advise its members to begin now to take economic precautions for tougher times it sees coming in 1954 and 1955. The association also says: "If the pattern repeats, the next big push upward will occur in the fall of 1959."

Tariff Study Authorized

One of the most important provisions in the Reciprocal Trade Agreements Act, which has been extended by Congress to June 12 1954, and awaits only the President's signature before becoming law, authorizes the appointment of a 17-member Commission on Foreign Economic Policy.

The commission is "to examine, study and report on the subjects of international trade and its enlargement, consistent with a sound domestic economy, our foreign economic policy and the trade aspects of our national security and total foreign policy." The fruits of the commission's work will be

wrapped up in a report to the President and Congress in March, 1954, at which time it will "recommend appropriate policies, measures and practices" concerning our foreign economic policy.

Another feature of the act, which went to the President minus the original House proposal to increase membership on the Tariff Commission to seven, is designed to protect domestic industry from outright damage through low-priced imports. Under this section, tariff relief cases will automatically be referred to the President, in the event of a tie vote of the six-man commission. Moreover, within 9 months after a tie vote occurs, the commission shall go ahead with a study and hearings to determine whether or not the industry making the request is suffering damage under the reciprocal trade agreement.

Foreign Aid Still High

Though the compromise Foreign Aid bill passed by Congress provides $4,503,457,000 in new foreign aid appropriations, it permits the spending of $2,121,964,391 appropriated last year but still unobligated. President Eisenhower had requested $5,121,964,391 in new cash and $2,182,815,979 in carry-over funds.

Of the $6.6 billion thus available for fiscal 1954, the total military spending will be about $5.1 billion —comprising $3.18 billion in new cash and $1.93 billion in a carry-over of unobligated funds. The best Pentagon estimate presently obtainable is that of the $5.1 billion for all foreign aid military spending in fiscal 1954 about $1.5 billion will go under the head of offshore spending — that is, procurement of ordnance and other military supplies from European manufacturers.

The remaining $3.6 billion of new and unobligated funds to be spent or obligated in fiscal 1954 will go to defense support, technical and economic assistance, development of foreign sources of basic commodities and Korean rehabilitation. Direction of the spending will be under Harold Stassen, director of the new Foreign Operations Administration which, under the President's reorganization plan, takes over the activities of the Mutual Security Agency, the Technical Assistance Administration and to some extent of the Institute of Inter-American Affairs.

Naval Air Cleaner

Off go two shells at once as the Navy test fires its new twin three-inch anti-aircraft gun. Firestone Tire & Rubber Co., Akron, has a $62 million production order for assembling the gun and making breech blocks and housings

Renegotiation Action Delayed

The faint hope that Congress would not extend the Renegotiation Act beyond the present Dec. 31, 1953, expiration date, has been assisted by congressional adjournment, before final action on it.

Yet, chances are that 1954 receipts and accruals will become subject to renegotiation, since Congress was evidencing such an intention. Before adjournment, the House had approved the bill, the Senate had favorably reported it, and only floor debate on amendments by the Senate Finance Committee held it back (see STEEL, Aug. 3, p. 51).

In the meantime, the Renegotiation Board, with an appropriation of $5,192,000 for fiscal 1954, will continue to process receipts and accruals during 1953.

Congress' delay in acting on extension will give industry more time to prepare its case on the controversial measure, which will be taken up as unfinished business in the next session.

More Titanium Coming

DMPA-Cramet contract will boost nation's sponge production to 13,200 tons by 1956

TITANIUM SPONGE production will be increased 6000 tons a year as a result of a contract between Cramet Inc., Chicago, and the Defense Materials Procurement Agency.

The contract calls for a $25 million plant which will be the largest titanium operation undertaken to date in the government-industry expansion program. The plant site has not been selected yet but one of several being considered is 250 acres near Nashville, Tenn.

Crane Subsidiary—Cramet is a wholly-owned subsidiary of Crane Co., Chicago. Its contract with the government calls for production of 30,000 tons of titanium sponge over a five-year period. Partial operations are expected to get underway at the new plant in early 1955 and full production a year later.

DMPA will advance Cramet up to $24,950,000 for construction and equipment costs to be repaid with interest as sponge is produced.

Two Others—Contracts for titanium sponge production with DMPA are also held by Titanium Metals Corp. of America and by E. I. du Pont de Nemours & Co. TMCA, now in partial production at Henderson, Nev., expects to be in full production at the rate of 3600 tons per year this fall. The Du Pont facilities at Edge Moore and Newport, Del., are being expanded to increase its production from the current 900 tons to 3600 tons per year starting in 1955.

Thus, with Cramet's contract, the U.S. will have a total capacity of about 13,200 tons of titanium sponge by 1956. More capacity is being sought because the goal by that time is for 25,000 tons.

SBA Replaces RFC

Small Business Administration, which replaces the Reconstruction Finance Corp., will take over RFC's lending functions in 60 days but will be limited to loans of not more than $150,000 to small firms unable to obtain private financing.

Scenes like this will be repeated as . . .

Idled Defense Tools Will Be Kept Ready

The first objective of new plans is to keep the equipment as near as possible to the firm which will use it if an emergency arises

WHAT WILL HAPPEN to production equipment idled by defense cutbacks?

The government gave the answers last week in a series of announcements. Quick action is required because of the tank-truck stretch-out program which will idle tools as early as next month.

Ready If Needed—Brig. Gen. C. H. Deitrick, commander of the Detroit Ordnance Tank-Automotive Center, says the objective is to keep idled equipment as near as possible to the plant operating it so that the tools can be back in production almost immediately in case of emergency. After World War II, tools were often sold or widely scattered in military depots. The tank-truck stretch-out as now constituted will eventually idle $615 million worth of tools. This is the four-way program of disposal, which will cost the U. S. about $50 million in storage charges:

1. The tools can be leased by the operating plants for civilian production. Studebaker under contracts just signed, will do this with $200,000 of tools when it ends its 2½-ton truck production in September.

2. The government will pay the operating plants for storing the tools. At its South Bend, Ind. plant, Studebaker will store the other $1.3 million worth of tools it used in producing trucks for the government.

3. The government will find or erect a warehouse in which to store the tools. Tools from Ford Motor Co.'s Livonia, Mich., plant will be stored in a new warehouse near the plant after the M-48 tank production is completed there in December.

4. As a last resort, the government will ship the tools to a depot for storage.

The Bosses — The management of the program was set up in two amendments to the Defense Mobilization Order 18. The Department of Defense will manage the idle equipment, and the Department of Commerce will keep the inventory.

Presumably, any reserve equipment to be purchased by the Defense department in the future will be handled in the same way that existing idled tools will be. In the $34.4 billion Defense department budget for fiscal 1954 is a $250 million appropriation that the military may use for the purchase and stockpiling of special production machinery which should be in reserve for emergency.

Down to One—The tank-truck production stretch-out was set up to reduce to one the number of manufacturers producing any one piece of equipment.

International Harvester Co., Ft. Wayne, Ind., won the contract to produce five-ton trucks after Jan. 1, 1954. Currently production is by IH, Mack Trucks Inc., Allentown, Pa.; and Diamond T Motor Car Co., Chicago.

No Problem Here — The Army has yet to select a "sole producer" for its M-48 tanks being made by Chrysler Corp. at Newark, Del., and Fisher Body Division of General Motors Corp. at Grand Blanc, Mich.

Bids in the competition for "sole producer" contracts for building 2½-ton trucks are expected from GMC Truck & Coach Division of General Motors at Pontiac, Mich.; Reo Motors Inc., Lansing, Mich.

Companies not getting "sole producer" contracts and having government-owned tools must negotiate for the disposition of the idle equipment.

In Same Boat—Other firms recently approached in the program are the American Locomotive Co., Schenectady, N. Y., which will quit M-47 tank production next spring, and the Lycoming-Spencer Division of Avco Manufacturing Co., Williamsport, Pa., which will cut its V-12 tank engine production after the first of the year.

Steel Order M-1A Amended

Under Amendment 2, effective July 31, to the NPA iron and steel order M-1A, no steel distributor shall deliver, nor shall any person accept delivery of from any steel distributor, any nickel-bearing aircraft-quality alloy steel product unless:

a. Such alloy steel is required by specification and will be incorporated into aircraft, military catapults, aircraft arresting gear, guided missiles, airborne equipment or gas turbine and aircraft-type internal combustion engines for use in naval vessels; or b. such alloy steel is required by specification and for use in filling orders bearing allotment number A-3, A-4, A-5, A-7, E-1, or E-2.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

Uncle Sam is preparing economic safeguards against recession, if and when it comes. The initial remedies would be mild and relatively inexpensive

WHAT'S THE PREVENTIVE medicine that Uncle Sam will prescribe in case the economy shows signs of turning sickly?

It's in vigorous health at the moment, but a few aches and pains here and there (see pp. 57, 71 and 153) are beginning to appear.

On the Job—To provide an antidote for any possible future recession is the job of the President's recently appointed Advisory Committee on Economic Growth and Stability. It's working in conjunction with the Council of Economic Advisers and the Commerce department, and has already come up with the main outline of a program. The economists are optimistic and do not look for any substantial shrinkage in business volume soon. But if and when business does have troubles, they will recommend these three courses:

1. Reduction of taxes to give business and the public more money to spend.

2. Liberalization in monetary policy—loosening of credit, reduction in interest rates, reduction in reserve requirements of banks—to encourage loans and spending.

3. Encouragement to state and local governments to expedite building of schools, construction of highways and other public works.

Cautious Approach—Thus the combat against a mild depression would not involve any great increase in federal spending and would cost the federal government only the losses in income resulting from reduced taxes. In case of a deep depression like that which set in in 1929 and 1930, of course, more far-reaching measures would be recommended, including large federal spending for public works, declaration of moratoria, etc. But no such contratemps is seen as remotely possible in the period ahead.

The Department of Commerce is prepared to undertake a powerful public relations job in case of adverse business winds. It believes that business itself can do a great deal to prevent a depression or bring quick recovery—by aggressive and imaginative advertising and promotion campaigns, by introducing new and improved products, by quoting attractive prices.

Role of Psychology—It believes also that a lot can be done through publicity to persuade the public to step up spending to avert a depression or cure it. This belief springs from the experience the Committee for Economic Development has had with its economic workshops all over the country during the past five years. After the Korean War began, CED lecturers persuaded the schoolteachers and others who attended these workshops that the fight against inflation required a reduction in spending, an increase in saving. Results were regarded as gratifying. Commerce department brass thinks that a proper campaign would succeed in convincing people that everybody loses out by following the instinctive urge to pull in the purse-strings in a time of depression and wait for lower prices.

Look for some turn-about slogans at such a time—like "Spend—This Is Not the Time To Save."

New Look at Resources . . .

President Eisenhower notified Congress that the nation must build a balanced program for use and development of its natural resources, and that he will make suitable recommendations next year for implementing such a program.

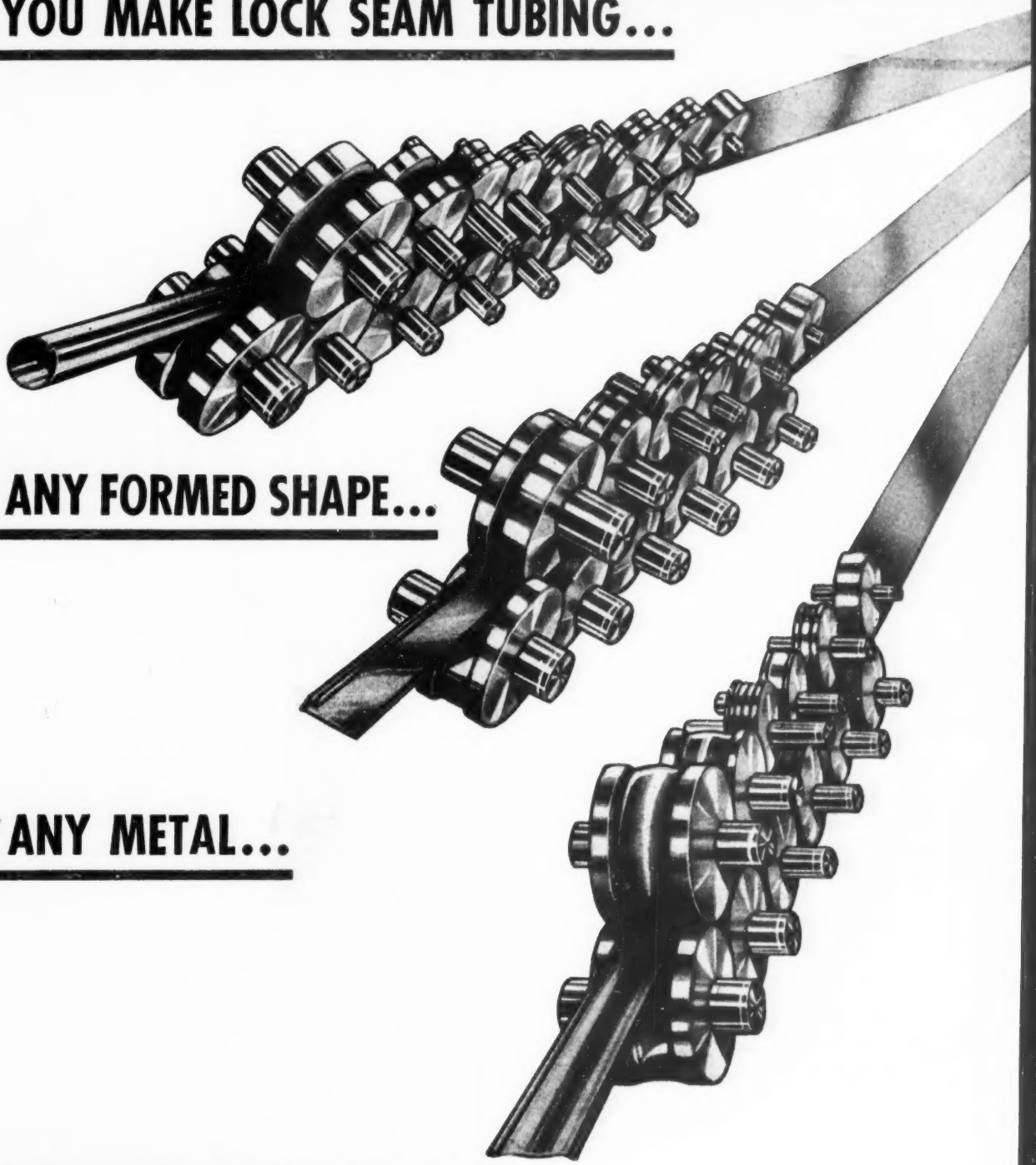
A probe to determine American access to strategic raw materials with special reference to American self-sufficiency during wartime conditions is being organized by the Malone Subcommittee on Minerals, Materials and Fuels, Senate Committee on Interior and Insular Affairs. Hearings will start the third week in September and report is to be submitted to the Senate prior to Jan. 31, 1954.

United Press

New Assistant Secretaries of Defense

The appointments of Charles Sparks Thomas, left, and Donald Aubrey Quarles, right, as new assistant secretaries of defense were announced last week by Sen. Leverett Saltonstall (Rep., Mass.), center, chairman of the Senate Armed Forces Committee. Mr. Thomas is the assistant secretary for supply and logistics and Mr. Quarles is the assistant secretary for research and development

IF YOU MAKE LOCK SEAM TUBING...



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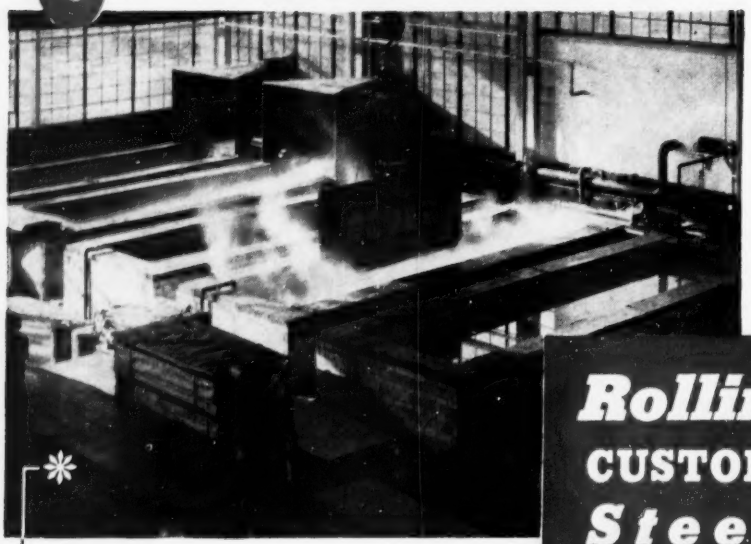

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Phone: MAnsfield 6-4242

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Phone: Riverside 7920

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Phone: Broadway 3468
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548 W. Mechanic Street, Jackson, Mich.
Phone: 2-9097
Glenn Christman, Sales Representative

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Donald M. McEwan, Sales Representative

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Phone: 5750
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Phone: Howard 7407
Tony Canadeo, Sales Representative

ECSC Steel Prices Backfiring?

European Coal & Steel Community pricing arrangements have raised prices instead of lowering them for the French. Watch for French price cutting if the Germans succeed

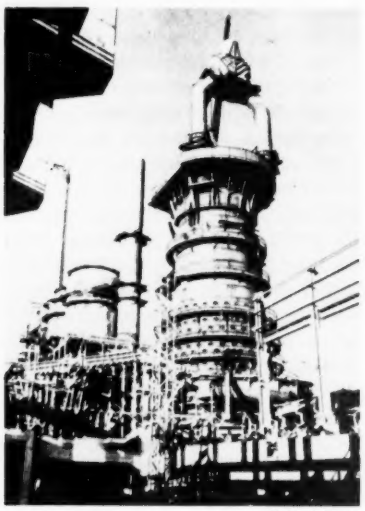
FRENCH STEELMAKERS are beginning to think the European Coal & Steel Community pricing arrangements have backfired on them.

ECSC was supposed to enable member countries to price their steel competitively with other Western producers thus enhancing new order prospects and leading to increased production. So far, however, French prices have risen an average of 5.8 per cent under ECSC pricing instead of the 3.3 per cent expected last April, new orders are slow and in relatively small amounts, and production shows a curve jogging downward.

Attractive North America—About the only bright spot in the current picture is the rising cost of U. S. steel which has helped Western Europe's, and France's, competitive position in North America. Not missing a bet, the French have boosted prices of bars, beams and wire rod $3 a metric ton for deliveries to the U. S. and Canada. For the latter markets, French bars are now selling for $87 per metric ton; beams, $93 a ton; wire rod, $90 a ton.

That helps but it's not a solution to the main problem. French steel production was 1,311,300 tons in January, 1953; 1,192,400 tons in February; March, 1,303,500 tons; April, 1,226,500 tons; May, 1,188,000 tons and June, 1,259,500 tons. French steelmakers are saying that, unless ordering picks up, their backlogs will no longer represent the fluffy cushion it once did and they will be forced to cut back production drastically.

Follower—Real pivotal point in the French problem is prices. Steel sheets that used to cost $108 a metric ton now cost $114; rails which used to cost $100 a metric ton now cost $106. Watch for the French to quickly follow suit if the Germans (Aug. 3, p. 65) are able to effect any real price cuts for steel products.



United Press

Blast Furnace for Brazil

Second blast furnace at Brazil's Volta Redonda steel mill is expected to be blown in in October of this year. When two new open hearths are put into operaton, the mill's steel ingot production capacity will increase to over 700,000 tons a year

Tool Show in Brussels

The European Machine Tools Exposition will be held at Brussels this year from Sept. 4 to 13. Among the 700 exhibitors signed up for the show are 310 from Germany, 124 from France, 64 from Switzerland, 57 from Italy, 56 from Belgium, 42 from Great Britain, 21 from the U. S., 21 from Sweden and 19 from the Netherlands.

Belgian machine tool builders are expected to exhibit the first European lathe entirely electronically-controlled, which insures cutting speed will remain constant throughout the work.

Europe Boosts Defense Output

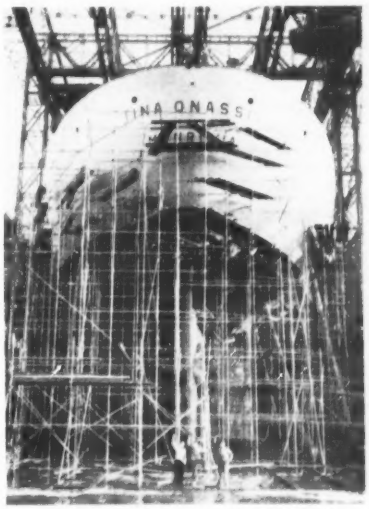
Western European industrial plants stamped out $3 billion in defense production during the 12 months ending in June, 1953, says the Mutual Security Agency. That's almost three times the output, as reflected by the European countries' defense expenditures, of the 1950-51 period.

Large part of U. S. aid in this production record was channeled into 134 major industrial projects which were sponsored by the Economic Cooperation Administration and MSA. More than 60 per cent of the MSA-ECA funds authorized for projects in Europe went into production of steel and power. Some 30 iron and steel projects—six in France, ten in Italy, two in the U. K., six in Austria, and others in Belgium, Netherlands and Portugal—have helped to more than double the total production of steel since 1947.

Rolling Mill for Iraq?

Among recommendations for industrialization of Iraq is a proposal to set up a hand-operated rolling mill and an electric furnace. Output would be about 5000 tons annually of "reinforcing bars, window shapes and small angles, all of which are in great demand."

The recommendation is contained in report of a survey conducted by the International Bank for Reconstruction and Development. The proposed steel plant would operate on Iraq's steel scrap supply which is approximately 5000 tons annually.



United Press

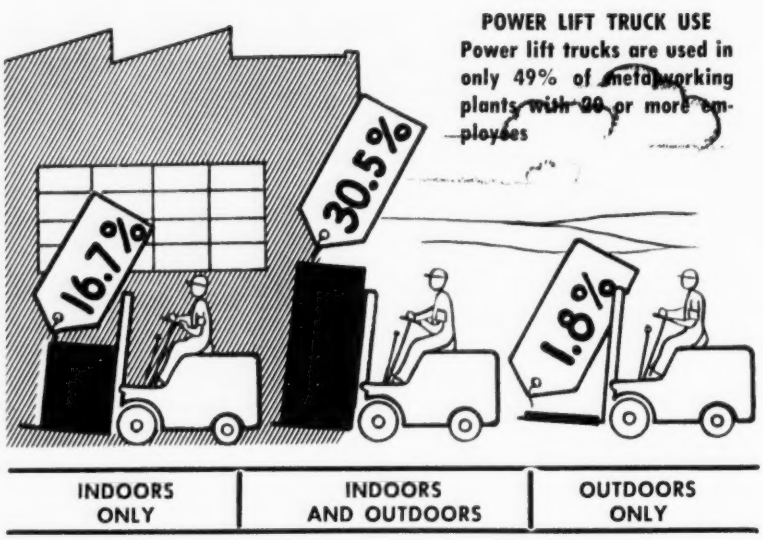
Germany Builds a Tanker

Workers in the German Howaldt shipyards remove scaffolding on the 700-foot, 45,000-ton tanker, *Tina Onassis*, in preparation for launching. The huge tanker will soon be put into service under the Liberian flag and will sail for the Olympic Maritime Agency

A STEEL MARKET RESEARCH STUDY

INDUSTRIAL TRUCK MARKET:

The Lift's Still There



POTENTIAL SALES APLENTY for makers of power-lift trucks are indicated by a STEEL market research study.

With a better than 30 per cent return to questionnaires sent out to 2664 selected metalworking plants, the STEEL survey points out that only 49 per cent of all plants employing more than 20 persons are using power-lift trucks for materials handling jobs.

Big Market: Small Plants—Biggest area for expanding the use of the trucks is with the smaller plants. The survey indicates that use of the trucks today ranges from 32.5 per cent by the plants employing 20 to 99 persons to 98 per cent use by the plants with over 1000 employees. The majority of the plants use the machines both indoors and out, rather than in one special place.

By far the most popular type for both indoor and outdoor work is the fork lift truck on which the operator rides. Ninety per cent of the plants with trucks use this type. The walkie-type is used by 34 per cent of the plants inside (many use both types) and about 8 per cent outside.

But No Diesels—Analyzed in both total plants and size groups, metalworking plants prefer the gasoline power-lift trucks for outdoor use. However, there is considerable difference in the preference of various size plants of the type truck preferred indoors. The larger plants prefer the electric truck inside, and as the plant size decreases, the preference is for gasoline-powered trucks. No plants reported a preference for diesel powered trucks.

Plants using gasoline trucks listed these reasons for their preference: Less operational expense, less downtime for maintenance, and higher power potential.

Plants preferring electric trucks indoors gave these reasons for their preference: Smokeless and fumeless operation, quieter operation, and less downtime for maintenance. Those using them outdoors also listed less operational expense along with the first three reasons.

Only 30 per cent of the plants use power-lift trucks with a capacity of 2000 pounds or less. The lighter lift truck is used mostly indoors and the heavier truck (4000 pound and over capacity) is mostly used outdoors.

Gas or Electric?—The industry, analyzed in total, is about evenly divided on the question of which type power-lift truck (electric or gasoline powered) is most economical to maintain. However, there are significant differences in answers of various size plants. The large plants say the electric is most economical and the small plants say the gasoline truck is most economical.

Keeping maintenance records apparently has little influence on the preference for the economical maintenance of one type truck over another because the answers differed little between plants keeping records and those not keeping records. Over 69 per cent of plants employing over 1000 keep records while only 19 per cent of plants in the 20-99 employee group do.

Few Engineers—The use of materials handling engineers is not wide-spread in the industry and most of the positions today are with the large plants. In the over 1000-employee plant classification, 45 per cent have materials handling engineers. Only 10.9 per cent of the plants in the 500-999 group have engineers and this drops to 3.3 per cent in the 20-99 employee plants.

There is no one man at whom you can aim your sales program for lift trucks, STEEL's survey points out. Significant roles in the purchase of power-lift trucks are played by company presidents and by production and purchasing personnel.

● *This is one in a series of* STEEL's *market research studies designed for management in the metalworking industry. Watch for the next one. It's on instruments.*

DEFENSE TOOLING Takes a Back Seat

Last year tool and die shops reported from 50 to 80 per cent of their output going for defense purposes. This year the defense proportion is down but not new ordering

TOOLING FOR DEFENSE is taking a back seat in most of the country's tool and die shops but civilian customers are quickly reoccupying the open space.

Last year tool and die shops reported from 50 to 80 per cent defense work on their schedules. Current estimates run from 20 to 50 per cent, with the exception of the Los Angeles area where a reported 80 per cent of tool and die work still is for military production.

Ahead of 1952 — Even with the drop in defense tooling, there has been little letup in new orders, however. Backlogs are extended about the same as last year at this time, an average 2½ months. In some areas, Detroit for example, backlogs are even larger than a year ago. New orders, in total, ran a little ahead of 1952 for the first five months of 1953. At that first half pace, or even at the slightly slower rate actually expected, dollar sales of tool and die shops this year should have no trouble equaling 1952's $700-million-plus figure.

Civilian ordering for tools and dies is fairly well diversified with automotive manufacturers active, plastic mold, electronic equipment, radio and calculating machine, sewing machine, typewriter and appliance manufacturers all adding a share.

Nagging Problem — Lack of skilled labor remains the biggest problem of the industry; almost without exception tool and die shops say they could boost output if they could get skilled help. As it is, one shift operations are the rule because a second shift can't be manned.

Hours are shrinking slightly for hourly workers—it's as low as 45 hours-a-week in some places to an average of 50 to 55—as tool and die output becomes a little less urgent and fatigue from 60-hour-weeks shows up in key workers.

Definite, Constructive—"The National Tool & Die Manufacturers Association is committed to a program of increasing apprentice training and is planning definite, constructive steps in that direction," says George Eaton, executive secretary of the association. First step on the agenda is reconsideration of the recommended standards for apprentice training, unchanged since 1946, which call for 8000 hours (roughly 4 years) of training before the apprentice becomes a journeyman. The long training period, plus the almost as attractive wages on production jobs requiring much less training, makes job of finding and keeping apprentices for the full term a difficult one. "We're also faced with a common procedure in high schools where bright boys are trained for college whether they ever attend one or not while the not-so-bright ones are channeled into shop training. Tool and die shops need boys with brains," comments Mr. Eaton.

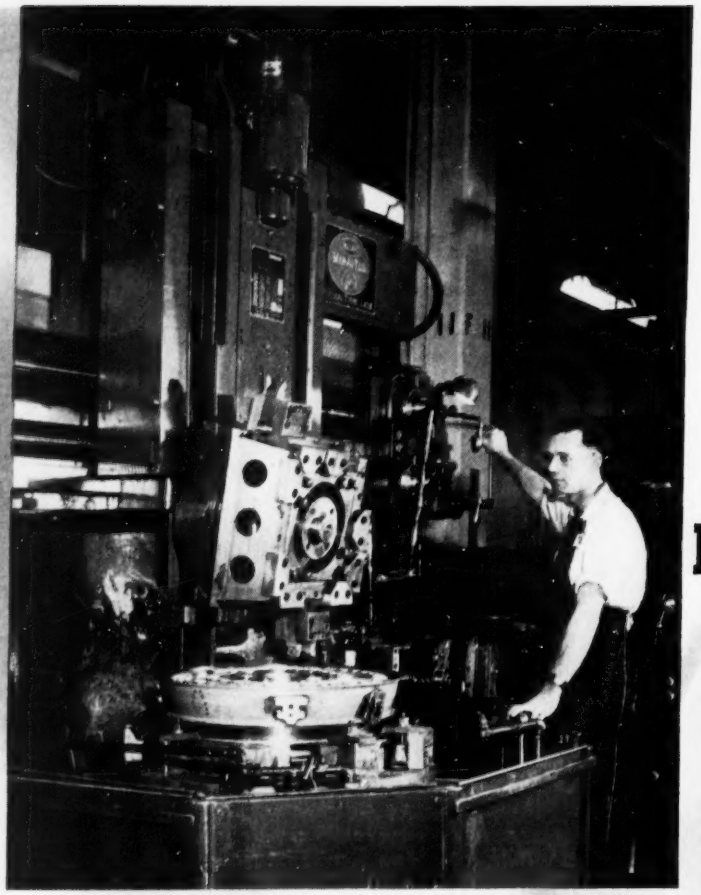
Even now job shops are adding one or two apprentices for the first time in two or three years. One of the best comments on the tool and die industry's long-term outlook is the comment of one Cleveland executive on these new apprentices: "We'll be able to use all we can get for a long time to come."

Surplus Disposal Time Reduced

A program reducing by an estimated 50 per cent the time required for screening military surplus materiel by the General Services Administration was adopted July 24. The program was set up by the Department of Defense to free valuable storage space which is occupied by obsolete or unneeded materiel.

Items of low value and low utilitization potential are now screened only in the GSA region in which the property is located. High value items are still screened government-wide. Items of less than $100 and obsolete materiel are disposed of within each military service eliminating screening of 65 per cent of items previously included.

Some categories have been granted complete exemption from screening: ship parts, locomotive parts, certain automotive parts, materials handling equipment and construction equipment parts, parts and components for electronic equipment, and parts and accessories peculiar to military type equipment. Limited screening is authorized for machine tools, textiles, wearing apparel, and shoes.



Pacemakers on the *Jet* PROGRAM

The inception of Man-Au-Trol Vertical Turret Lathe started a new manufacturing era in the boring mill field.

Man-Au-Trol manual or automatic control has taken the guess work out of previous manual operations on highly accurate repetitive work.

Automatic change of feeds and speeds at the proper instant, automatic change of direction of feed, automatic precision indexing of heads for succeeding operations — all contribute to the productive efficiency and minimum operator fatigue at a pace previously unobtainable in single spindle machines of the size and capacities of Man-Au-Trol.

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Learn about the manufacturing efficiency of this machine as applied to your work.

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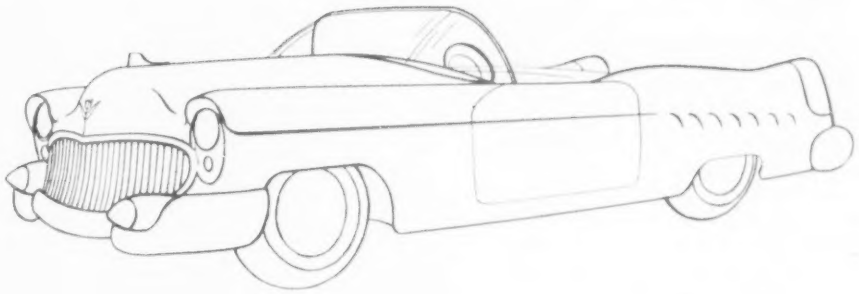
By FLOYD G. LAWRENCE *Detroit Editor*

Mirrors of Motordom

GM LOOK FOR '54?

STEEL's artists put together features from General Motors experimental cars of 1953 which may characterize the GM look for '54



Here's a peek at the 1954 models. GM leans to sports car prototype styling, Chrysler emphasizes mechanical changes, and Ford features new engines

DETROIT

THIS is the time of year when executives and motorists begin to pace the floor—Detroit is getting ready to have its 1954 babies.

What will the 1954 models look like? How will they perform? Will the horsepower race continue? Will my 1952 be outmoded? These are the questions on many lips these days and they are questions not easily answered. The automakers have a few million 1953 models to sell before they swing open the closely guarded maternity room doors.

Pattern Emerges — But every automobile is made with tools and dies jobbed out to men not connected with the auto companies. Every automobile is engineered by men not concerned with dealers. And many of these men talk with some pride and considerable revelation about their work As the pieces come in they begin to form a pattern. Before long the patterns form a picture.

Some of the information will undoubtedly prove to be wrong, for it must be borne in mind that a man designing a welding jig for a floor pan can be mistaken in thinking it looks like step-down design. But much of the information will prove to be accurate since all of it is based on fact rather than rumor.

The Picture — Here is the 1954 model picture: General Motors' cars will pick up in many cases the sports car prototype styling, Chrysler will emphasize mechanical rather than styling changes and Ford will hang its pitch on the new OHV V-8 engines in the Ford and Mercury, with horsepower and a Continental highlighting the Lincoln line. The independents will go along with minor changes except in the case of Hudson which will do a styling remake. Now let's take a closer look at your favorite brand:

Cadillac — The Cadillac of 1954 will be introduced about the first week in January. Featured will be the Lemans grill, wrap-around windshield and modernistic angular sculpturing of the tail fins. The headlight bezel will be obviated by prominent frenching of the fender itself in the style of the Lemans, giving a longer and lower look to the lower half of the body than heretofore. The corner post of the windshield will be well back toward the driver and extremely thin for better visibility.

Buick — The wildcat grill with extremely thin divided center bumper section rather than the two protrusions of the wildcat prototype will highlight the Buick to be introduced also the first week in January. Retained are the oval headlight bezels introduced on the Buick this year a la wildcat coupled with a fender line appearing somewhat higher and de-emphasizing body and hood height. Rear fenders will feature a kick-up to accentuate the higher fender line and the wrap-around windshield will lend the car a definitely sporty look. Mechanical changes in view of the new V-8 and Dynaflow units introduced this year will probably be slight.

Oldsmobile — The 1954 Oldsmobile, like the Buick and Cadillac, should be coming along about the first week in January. Also like its General Motorsmates, the Oldsmobile will pick up the sports prototype look with the starfire grill and fenderline treatment complete with wrap-around windshield. There are strong indications that the Oldsmobile will be going to step-down design featuring a unique transmission suspension system which will do much to minimize the transmission tunnel hump, but the information is inadequately confirmed.

Pontiac — Highlighting the 1954 Pontiac to be introduced early in December will be the much speculated about OHV V-8 for which equipment is currently being installed in the Pontiac, Mich., plant. This unit will produce about 145 hp, depending on minor alterations for the exact figure and will be directly competitive with the new Mercury unit. Styling changes on the 1954 Pontiac include a higher fender line with continuation of the rear fender kick-up introduced this year to emphasize the higher line as on the Buick. Wrap-around windshield will not be introduced until next year. Pontiac has plenty new to offer without it.

Chevrolet — The 1954 Chevrolet to be introduced the first week in

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December will move stylewise somewhat in the direction of the Corvette. The side rear fender bulge will be eliminated, creating a flowing effect curving downward in the rear to give an airfoil-type fender line over-all. Extending rearward from the mid-point of the top of the rear fender is a chromed fin slanted downward at perhaps a 30-degree angle from the vertical into which are set the tail lights. The grill features an ellipse in the center but there is no further similarity to the Corvette treatment. Indications are that the ellipse theme will evolve into a Corvette-like grill next year. Wrap-around windshield is also probable next year and will not appear on 1954 models. Tooling for the OHV V-8 was moved up to a midyear deadline but whether or not the engine will be available even in limited quantities by 1954 seems doubtful.

Ford—The new Ford to be introduced the first half of December will feature an OHV V-8 delivering about 125 hp initially. Tooling for the engine is already in at the Rouge and pilot models are coming off the line assuring readiness for production by the end of the year. Styling changes on the 1954 Ford are notably meager. Most noticeable is a Buick-type "sweep-spear" extending with increasing width in an arc from the top of the front fender down to the top of the rear fender. Tail lights incorporate three spokes radiating out from the pineapple core and otherwise are unchanged. The grill moves back somewhat to 1952 with a circular center and a cutout thingamagig. Parking lights are moved up into the grill bar again and the hood ornament is slightly changed.

Mercury—Like the Ford, the new Mercury will feature on OHV V-8 engine delivering about 145 hp when it is introduced the first week in December. Styling changes are not known but reportedly will be largely a face-lift including a lengthening of the rear fender line and identification changes of the grill.

Lincoln—Horsepower and a Continental are expected to highlight the new Lincoln to be introduced about mid-December. Speculation on the horsepower figure of the 1954 model ranges up to 275 and is remotely possible, however a figure of 250 or somewhat below seems more feasible. A new Lincoln Continental reportedly will be built incorporating the basic body shell now being used with rear end modifications including a longer rear fender line and the famed Continental spare tire mount.

Chrysler — Big changes in the 1954 Chrysler expected to be introduced about the first week in November will be mechanical. Horsepower will be increased to around 220 and the new Power-Flite transmission will be available as optional equipment on all Chrysler models. Styling changes are largely identification, including a gravel guard with three rearward streamlines, a more acutely frenched tail-light bezel to lengthen the appearance of the rear fenders, and minor grill modifications still on the single bar theme, but with a curve in the middle.

De Soto, Dodge, Plymouth — These cars also scheduled for November introduction will include minor styling identification changes a la Chrysler. De Soto and Dodge are expected to get the Power-Flite transmission as optional equipment with some horsepower increases. Plymouth is reportedly working hard to get the OHV V-8 this year and is expected to make it with initial horsepower pegged at about 125 but Power-Flite is not reported to be coming on the Plymouth until 1955. Styling on the 1955 line of Chrysler Corp. cars, incidentally, is reported to be breath-taking. For 1954, brighter colors will keynote the appearance of the Chrysler products.

Hudson—A basic changeover is now under way at Hudson for the line to be introduced early in September. Abandoned is the body which Hudson has used since 1948, with the new body reported to be leaning stylewise toward the Hudson Jet. Better visibility, easier exit and entrance and reduction in the transmission tunnel hump are expected to be hallmarks of the new Hudson line which will retain step-down design. Major mechanical changes will be coming in 1955 with styling the chief Hudson pitch in 1954.

Kaiser-Willys— Owing to problems of the merger, exact date of the new model introductions by Kaiser-Willys are not known even to the management. It is expected that the cars will be ready to go about February, however, with identification changes in both lines of cars for 1954. Consolidated styling is expected to appear in the cars by 1955 but manufacturing considerations preclude the possibility earlier.

Nash—Changes in the Nash line to be introduced late in November will be largely face-lift. Included in the Ambassador and Statesman series are a new grill which curves inward rather than outward giving the car a more European look and minor trim changes. The Rambler series will feature a new station wagon model with a notched roof and a luggage rack on the top enclosing the notch.

Studebaker — The new Studebaker to be introduced early next year will feature a return to the convertible, with one report that a station wagon could be added to the line.

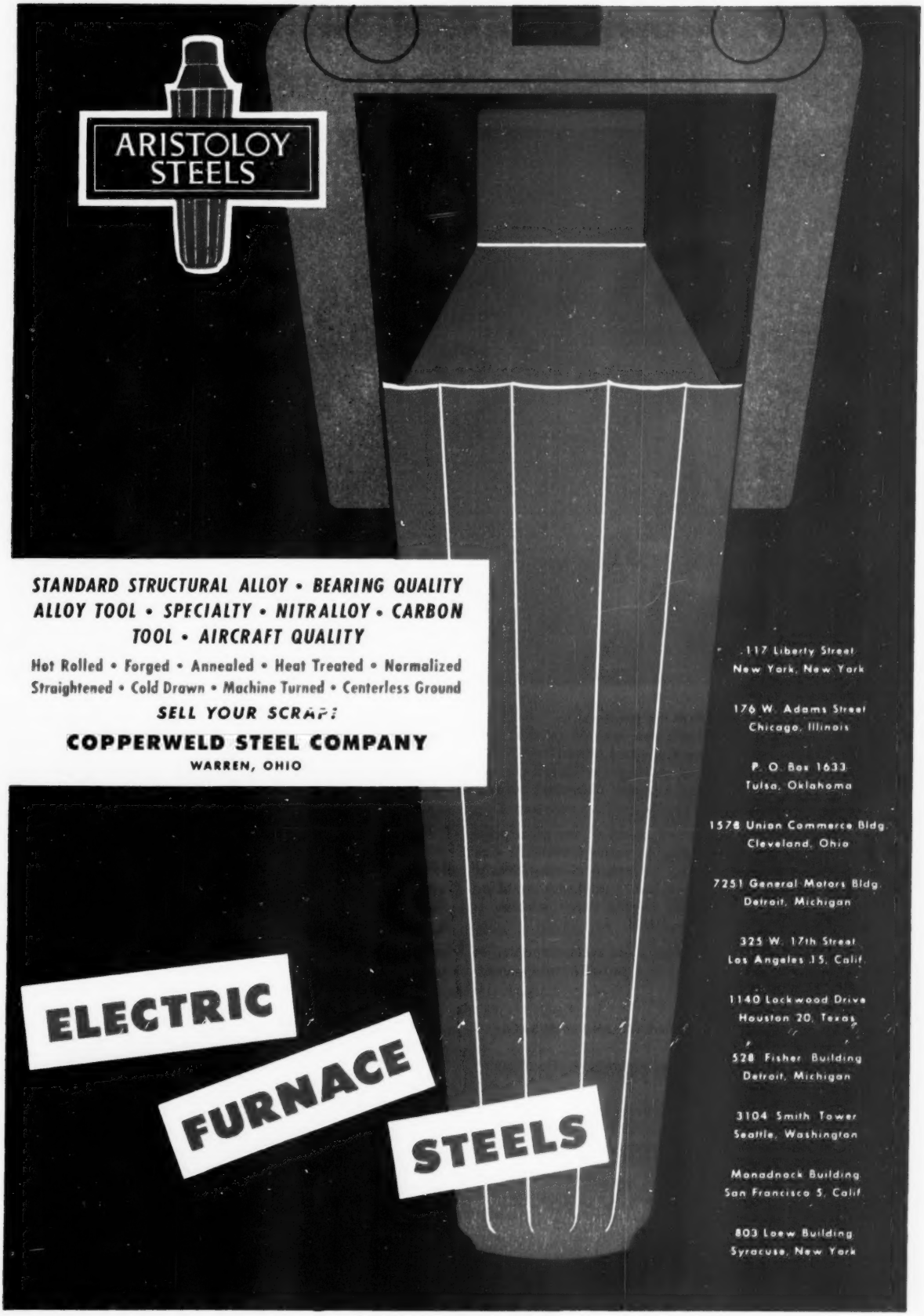
Auto, Truck Output

U. S. and Canada

	1953	1952
January	612,815	424,559
February	623,793	464,577
March	752,474	525,024
April	782,453	570,464
May	685,390	542,559
June	713,206	542,479
July		226,134
August		322,755
September		595,715
October		656,767
November		548,782
December		569,715
Total		5,989,509

Week Ended	1953	1952
July 4	140,491	86,052
July 11	167,560	70,592
July 18	175,555	32,468
July 25	172,874	42,514
Aug. 1	169,690	22,181
Aug. 8	150,000*	43,964

Sources: Ward's Automotive Reports
*Estimated by STEEL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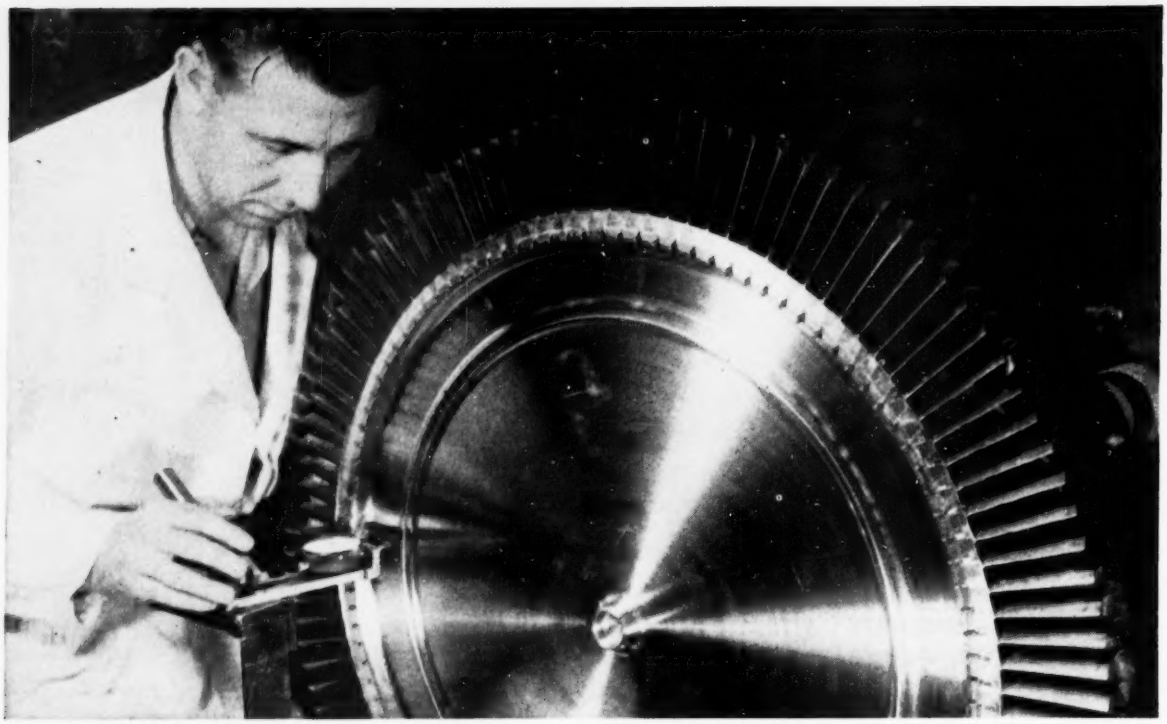
1578 Union Commerce Bldg.
Cleveland, Ohio
7251 General Motors Bldg.
Detroit, Michigan
325 W. 17th Street
Los Angeles 15, Calif.
1140 Lockwood Drive
Houston 20, Texas
528 Fisher Building
Detroit, Michigan
3104 Smith Tower
Seattle, Washington
Monadnock Building
San Francisco 5, Calif.
803 Loew Building
Syracuse, New York

A.V. ROE CANADA LTD. specifies "16-25-6" for rotor wheels in new Orenda jet engine



FROM the first designs to volume production, "16-25-6" was the alloy selected for rotor wheels in the new Orenda jet engine. A. V. Roe Canada Limited says, "No other alloys were considered during the development, since this particular alloy had become identified by and large as *the* successful specification . . . ".

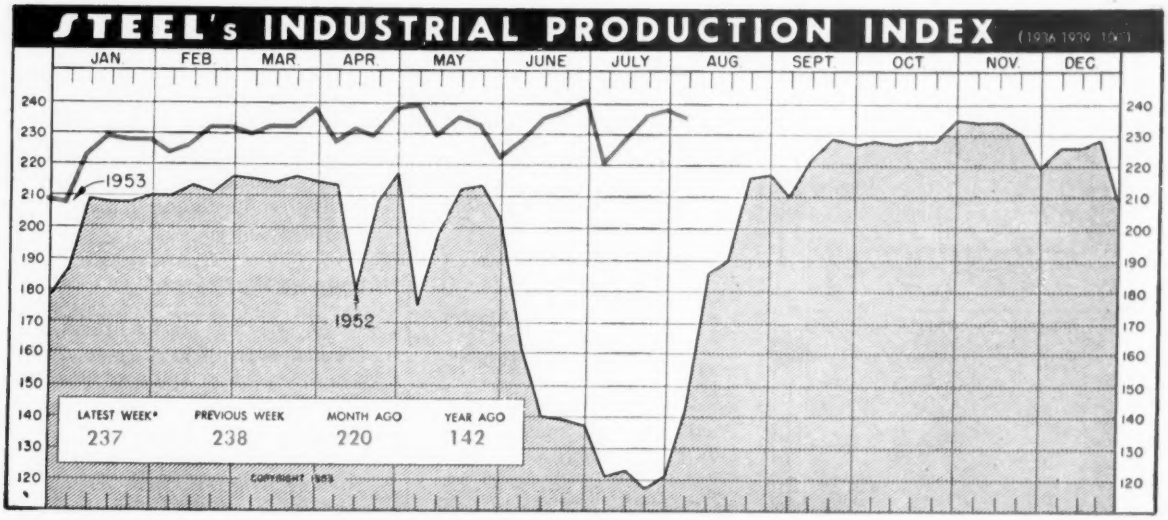
Acceptance like this has made "16-25-6" the most popular super-alloy steel for jet engine rotor wheels. It was first developed by the Timken Company during World War II and since it was the *one* suitable steel that could be produced commercially for jet engine rotor wheels, it helped make jet propulsion practical.

Today, more "16-25-6" goes into solid and composite jet engine rotor wheels than all other super-alloy steels combined! That's because "16-25-6" has the *best* combination of the three top requirements for jet engine rotor wheels: 1) It has good high temperature properties. Operating at temperatures up to 1500°F., it retains high creep and stress rupture strength. And it has excellent resistance to scale and corrosion. 2) It is relatively low in strategic alloys. "16-25-6" uses none of the highly strategic alloys, contains no cobalt or columbium. 3) It has good machinability.

Make use of the Timken Company's wide experience in high temperature steels. We'll help you adapt "16-25-6" to your purposes—or help you pick other alloy steels suited to your needs. Write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



*Week ended Aug. 1

Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automotive Assemblies (Wards' Reports) 20%.

Auto production sags while some manufacturers check inventory. Reductions in steel demand are being made by some car producers

AUTOMOBILE PRODUCTION will dip considerably this month. Chief cause of the downturn from the July level, which was the highest since April, will be the prolonged taking of inventory by Chrysler. Even if industry schedules are met, output will drop 40,000 to 50,000 units. Although this reduction represents about a 7 per cent decline in the month, the actual decrease might run as high as 15 per cent.

Outlook—In proper perspective, the August production dip will probably not alter the record pace set so far this year. U. S. output of cars during the first seven months of the year totaled 3,852,500 units, more than 140,000 units above the same period in the peak year of 1950. Yet, with the usual year-end decline in production approaching, it would not be surprising if outturn this year fell below that of 1950.

Current Score—During the week ended Aug. 1, U. S. and Canadian plants turned out 169,690 cars and trucks, according to *Ward's Automotive Reports*. Activities at Nash and Kaiser continued to be blacked out and production difficulties hampered output at Dodge and Plymouth. General Motors and Ford still set the sales pace. The GM effort during the second quarter resulted in a 63 per cent gain in sales over a year ago.

Cautious—The August decline in automotive scheduling has brought with it some cancellations and delays in ordering steel. The effect of these changes will become more noticeable in the fourth quarter. At the present time the steel industry's current daily new business is still in excess of shipments and production has remained at a high level so far this year.

Still Busy—Furnaces of the steel industry poured 2,189,000 net tons of steel for ingots and castings during the week ended Aug. 8, the American Iron & Steel Institute says. This is more than was produced in the previous week, when STEEL's estimated national rate was 96.5 per cent but 5.5 per cent less than the same week in 1951.

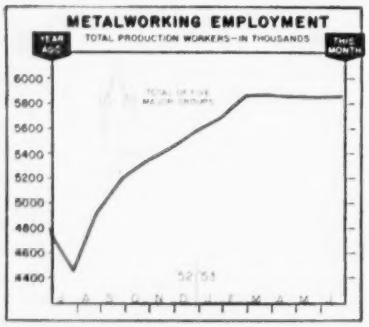
Lighter Loadings—Loading of railroad revenue freight for the week ended July 25, totaled 780,705 cars, a decline of 1.4 per cent from the previous week, according to the Association of American Railroads. The decline results largely from reduced loadings of miscellaneous freight, coal and forest products. The drop in miscellaneous loadings may reflect to some extent the weakened demand for consumer durable goods.

Electrifying Record—During the week ended July 25, the electric power industry set another output record. The industry distributed 8,460,427,000 kilowatt-hours of electricity, according to the Edison Electric Institute, as textile and chemical activities increased along with expanded use of air conditioning, refrigeration and water pumping during the sultry weather. This year's contraseasonal increase for electric energy continues to run about 15 per cent above last year.

Production Slides—STEEL's industrial production index dropped slightly in the week ended Aug. 1. During the latest week it registered 237 per cent of the 1936-1939 average, 1 percentage point less than the previous week, which was the highest week for production since the Fourth of July.

FRB Index: Up and Down . . .

The industrial production index of the Federal Reserve Board reveals that output during June rose from the previous month. At the end of June it stood at 241 per cent of the 1947-1949 average on a seasonally adjusted basis. This is 1 percentage point more than the month of May. Principal factors in

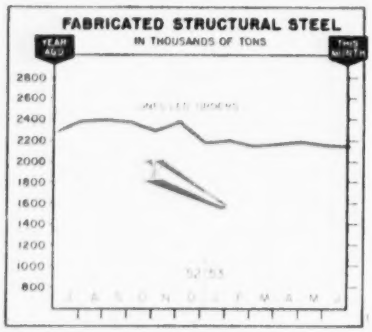


Metalworking Employment

In Thousands

	Production Workers—Five Major Groups				
1952	**Prim. Mtls.**	**Fab. Prod.**	**Mach- inery**	**Elec. Mchy.**	**Trans. Equip.**
June	716	769	1,261	706	1,323
July	676	726	1,203	685	1,169
Aug.	1,110	783	1,181	708	1,192
Sept.	1,153	821	1,193	743	1,330
Oct.	1,162	847	1,212	766	1,380
Nov.	1,173	863	1,242	784	1,421
Dec.	1,183	881	1,283	800	1,460
1953					
Jan.	1,188	891	1,289	804	1,484
Feb.	1,142	942	1,323	916	1,543
Mar.	1,145	952	1,335	925	1,574
Apr.	1,144	951	1,326	926	1,572
May	1,138	951	1,309	920	1,571
June	1,143	954	1,304	912	1,592

U. S. Bureau of Labor Statistics.

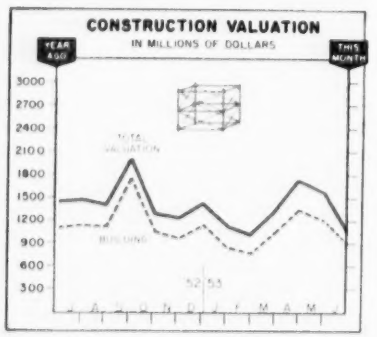


Fabricated Structural Steel

Thousands of Net Tons

	Shipments		**Backlogs**	
	1953	**1952**	**1953**	**1952**
Jan.	241.4	244.9	2,180	2,416
Feb.	251.1	246.4	2,128	2,408
Mar.	266.3	268.8	2,155	2,501
Apr.	263.2	230.7	2,168	2,350
May	263.8	244.2	2,179	2,263
June	274.6	125.5	2,153	2,261
July	....	138.3	....	2,361
Aug.	....	226.3	....	2,363
Sept.	....	227.6	....	2,342
Oct.	....	261.7	....	2,266
Nov.	....	222.6	....	2,357
Dec.	....	225.2	....	2,153
Total	....	2,664.3		

American Institute of Steel Construction

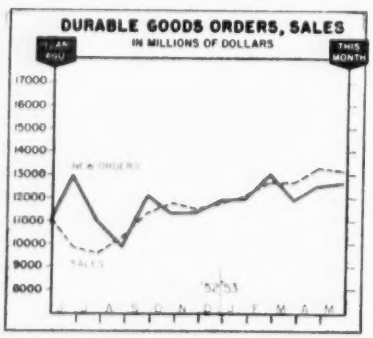


Construction Valuation

(37 States)—In Millions of Dollars

	Total		**Building**	
	1953	**1952**	**1953**	**1952**
Jan.	1,075.9	902.1	867.0	695.4
Feb.	1,021.3	885.2	792.9	697.8
Mar.	1,347.5	1,321.3	1,054.4	1,056.0
Apr.	1,741.5	1,597.5	1,354.2	1,243.9
May	1,606.1	1,563.6	1,219.8	1,216.2
June	1,115.5	1,488.8	922.3	1,133.3
July	.....	1,511.3	.....	1,170.8
Aug.	.....	1,438.7	.....	1,147.5
Sept.	.....	2,039.2	.....	1,796.8
Oct.	.....	1,310.1	.....	1,072.8
Nov.	.....	1,248.8	.....	989.9
Dec.	.....	1,467.4	.....	1,147.7
Total	.....	16,774.9	.....	13,362.1

F. D. Dodge Corp.



Durable Goods Orders, Sales

In Millions of Dollars*

	New Orders		**Sales**	
	1953	**1952**	**1953**	**1952**
Jan.	12,080	11,142	12,195	10,861
Feb.	13,138	11,519	12,828	11,352
Mar.	12,023	12,171	12,821	10,632
Apr.	12,621	12,443	13,490	11,310
May	12,843	10,956	13,263	11,328
June	.....	13,138	.....	10,060
July	.....	11,140	.....	9,777
Aug.	.....	9,998	.....	10,437
Sept.	.....	12,328	.....	11,510
Oct.	.....	11,452	.....	11,968
Nov.	.....	11,441	.....	11,676
Dec.	.....	12,011	.....	11,913

*Seasonally adjusted. U. S. Bureau of Business Economics

Charts Copyright 1953 STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Employ., Steel ....June 1	Machine Tools ....Aug. 3	Refrigerators .....Aug. 3
Foundry Equip. ....July 27	Malleable Castings..July 20	Steel Castings .....July 20
Freight Cars .....July 27	Prices, Consumer ..June 22	Steel Forgings .....July 20
Furnaces, Indus. ..July 13	Prices, Wholesale ..July 27	Steel Shipments ...June 22
Gear Sales .....July 13	Pumps .....July 27	Vacuum Cleaners..Aug. 3
Gray Iron Castings..July 20	Radio, TV .....May 25	Wages, Metalwk. ..July 6
Indus. Production ..June 22	Ranges, Elec. .....Aug. 3	Washers .....June 29
Ironers .....June 29	Ranges, Gas .....May 18	Water Heaters ....July 29

the increase were an expansion in both coal and crude petroleum production as well as a gain in passenger automobile output. On the other hand residential construction declined.

For July, the Federal Reserve's preliminary figures on industrial production show a drop to 232 per cent. Vacations always give their index this jolt in July, so this decline really doesn't indicate any drastic changes.

Construction Record . . .

Construction expenditures increased slightly in July to a new monthly peak of about $3.3 billion, says the Bureau of Labor Statistics. The amount spent is about 8 per cent above that of the corresponding month in 1952, but only 2 per cent more than in the previous month. Seasonal gains in outlays for highway construction and public utilities, plus a more than seasonal rise in commercial construction account for the June-July increase.

Bigger Paychecks . . .

In mid-June weekly earnings of factory workers averaged $72.04. This is $13.19 more per week than at the start of the Korean war and a gain of 22.5 per cent during the last three years, according to the Bureau of Labor Statistics. Advances in hourly wage rates were primarily responsible for the rise in weekly earnings, which were offset partly by higher prices as well as steeper income taxes. Moreover, a larger proportion of the factory work force was employed in the higher-paid industries.

Business Slackens . . .

Manufacturers' shipments totaled $25.8 billion during June, about 20 per cent more than in June, 1952. Although durable goods shipments were off 2 per cent from the previous month, manufacturers' sales in June were about the same as in May. Slight sales rise was accompanied by an increase in inventories. Yet, the $500 million rise in their inventories was largely appreciation, for 75 per cent of the increase was in book values of durable goods in-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	96.5	96.0	43.0
Electric Power Distributed (million kwhr)	8,512	8,460	7,405
Bituminous Coal Output (daily av.—1000 tons)	1,529	1,533	1,115
Petroleum Production (daily av.—1000 bbl)	6,580[1]	6,569	6,132
Construction Volume (ENR—millions)	$297.5	$253.5	$1,131.6
Automobile, Truck Output (Ward's—units)	169,690	172,874	22,181
TRADE			
Freight Car Loadings (unit—1000 cars)	770[1]	781	733
Business Failures (Dun & Bradstreet, number)	182	184	152
Currency in Circulation (millions)[3]	$30,044	$30,051	$28,952
Dept. Store Sales (changes from year ago)[3]	+5%	+2%	−2%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$16,603	$18,177	$15,908
Federal Gross Debt (billions)	$272.6	$272.5	$263.0
Bond Volume, NYSE (millions)	$11.4	$11.4	$14.7
Stocks Sales, NYSE (thousands of shares)	5,800	4 471	5,552
Loans and Investments (billions)[4]	$80.0	$80.0	$76.2
United States Gov't. Obligations Held (billions)[4]	$32.9	$33.3	$33.3
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	189.38	189.38	181.31
STEEL's Nonferrous Metal Price Index[6]	227.1	225.9	224.6
All Commodities[7]	110.5	111.0	111.8
All Commodities Other Than Farm and Foods[7]	114.5	114.5	112.5

* Dates on request. [1] Preliminary. [2] Weekly capacities, net tons: 1953, 2,254,459; 1952, 2,077,040. [3] Federal Reserve Board. [4] Member banks, Federal Reserve System. [5] 1935-1939=100. [6] 1936-1939=100. [7] Bureau of Labor Statistics Index, 1947-1949=100.

dustries. All of the 1 per cent decline in new business was in orders for durable goods, which decreased 4 per cent from the May level. The entire June decrease of $1 billion in unfilled orders was in the durable goods backlog, particularly in fabricated metals and machinery.

Precious Paper . . .

Consumer credit outstanding at the end of June totaled about $27,051 million, up $4605 million over a year ago and $336 million above the previous month, according to the Federal Reserve Board. Installment payments account for almost 70 per cent of the consumer credit and the total of this credit now in use stands at $20,489 million. Once again, the increase in automobile paper took the lion's share of installment loans. Were it not for the fact that non-installment credit declined $75 million, the monthly use of credit would have risen more than $336 million.

Incorporations Rising . . .

Total new business incorporations for the first half of 1953 reached a six year peak of 54,471, Dun & Bradstreet says. Following the trend of recent years, it is probable that most of these new organizations are on a retail or wholesale level. The June number of new concerns, 8296, was slightly below the May figure of 8968, and June was the seventeenth consecutive month to record a gain over the like month of the previous year.

Warming Up . . .

A long-term trend toward more heat treating of metals was evident in the healthy expansion of orders for metallurgical furnaces, both from May to June and from 1952 to 1953, says Carl I. Ipsen, vice president of the Furnace Manufacturers Association, in explaining the rise in June orders for industrial furnaces. Total orders of $4,909,858 in June brought volume for the first half of 1953 to 93 per cent of the same period in 1952. The export business, which normally accounts for about 2 per cent of the volume, was more than twice as high during the first half of 1953 as it was in 1952.

Trends Fore and Aft . . .

Orders for pumps in June totaled $5,690,275, which was less than the previous month, according to the Hydraulic Institute . . . Assets of all banks in the U. S. totaled $206,210 million on June 24, $4417 million more than on June 30, 1952, says the Federal Reserve Board.

Help Lower Unit Production Cost to Meet Competition
PROFITABLY

Simplified screw driving, bolt setting and nut running mean lower unit cost. This is possible with Pheoll products because they are inspected through all manufacturing steps from coil wire or bar stock to the finished product.

All threads, whether rolled or cut, are carefully gauged to American Standards. Screw and bolt heads are formed, slotted or recessed to meet rigid engineering requirements. Overall quality of the finished product is uniformly high. Precision head formation on all bolts as well as engineered slots and recesses in all screws means less wrench and driver slippage.

Pheoll engineers will recommend the correct type, size and finish of standard or special screws, bolts and nuts for your needs.

WHAT PHEOLL INDUSTRIAL FASTENERS MEAN TO YOU

- Simpler and speedier assemblies.
- Less worker fatigue — more units.
- Improved product appearance.
- Added latitude in product design.
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CHECK THESE PHEOLL PRODUCTS FOR YOUR NEEDS

- ☐ Machine Screws
- ☐ Sems
- ☐ Tapping Screws
- ☐ Square Head Set Screws
- ☐ Threaded Cutting Screws
- ☐ Cap Screws
- ☐ Phillips Recessed Head Screws
- ☐ Machine Bolts
- ☐ Wing Nuts
- ☐ Knurled Nuts

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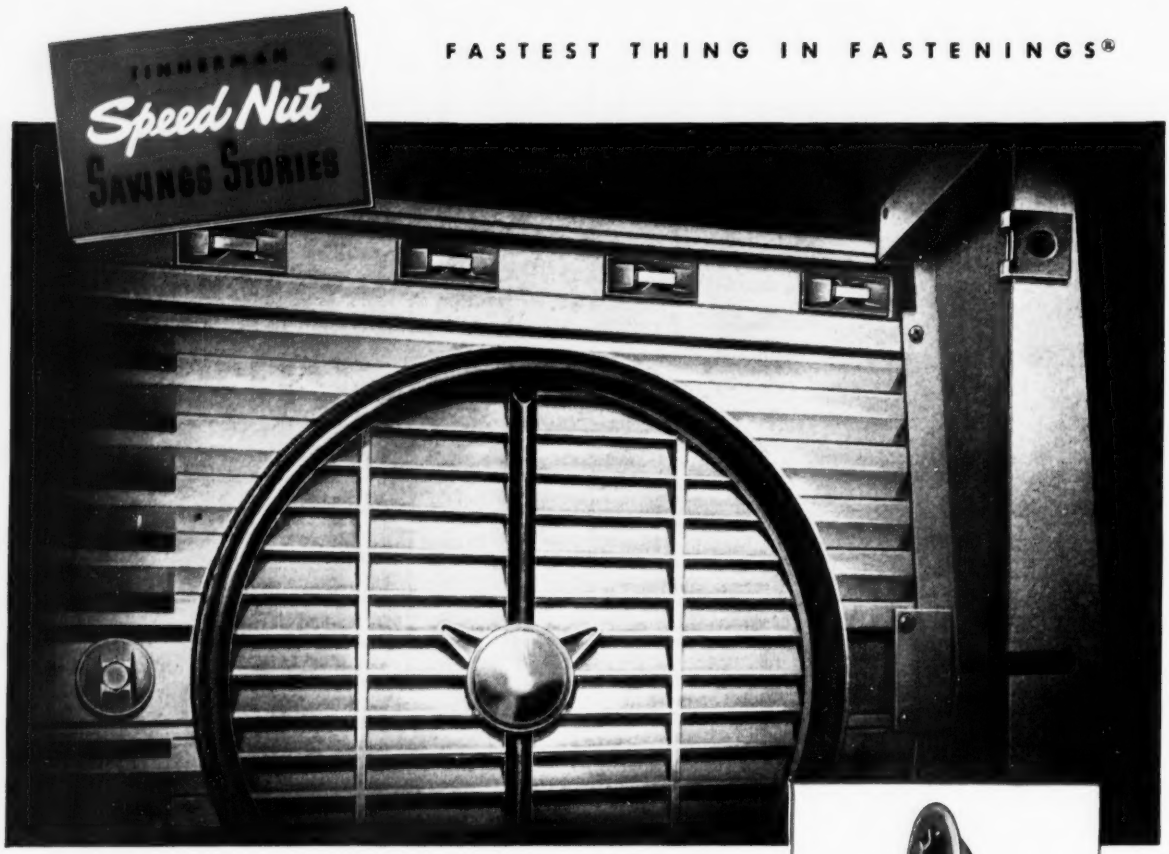
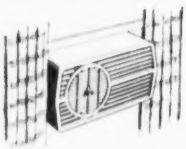
PHEOLL SCREWS BOLTS

FASTEST THING IN FASTENINGS®



SPEED NUTS® give new Room Air Conditioner "Cool" 82% Assembly Savings!

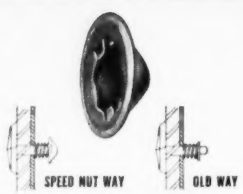


Fedders-Quigan Corporation, Buffalo, plans Tinnerman SPEED NUT savings in design stages

● The results of this fastening engineering greatly reduced assembly costs—brought substantial production increases! Fedders engineers are now using 35 Tinnerman SPEED NUT brand fasteners per unit . . . an increase of 200 percent in the new models, a tribute to SPEED NUT success! Typical of the savings achieved by Fedders is the 82% reduction in the cost of attaching the Comfort Circle grille with a Cap-Type SPEED NUT.

Looking for ways to convert fastening problems into savings? SPEED NUTS will help! These high quality, spring steel fasteners are light weight, vibration-proof and self-retaining; eliminate welding, staking, riveting; can be used over welded studs; do away with threaded inserts. These are a few of the SPEED NUT advantages that will annually save thousands of production dollars for Fedders-Quigan!

See your Tinnerman representative for full information on our free, cost-saving Fastening Analysis service.



Cap-Type Push-On SPEED NUTS

Formerly a special clevis pin and lock washer were required to retain the spring coil and Comfort Circle grille as illustrated above. Now, Cap-Type Push-On SPEED NUTS press on by hand in *one* operation, lock with vibration-proof bite . . . for a big 82% savings!

Send for your copy of SPEED NUT "Savings Stories", an interesting booklet of Tinnerman savings to industry, write: TINNERMAN PRODUCTS, INC., Box 6688, Dept. 12, Cleveland 1, Ohio. *In Canada:* Dominion Fasteners Ltd., Hamilton, Ont. *In Great Britain:* Simmonds Aerocessories, Ltd., Treforest, Wales. *In France:* Aerocessoires Simmonds, S.A.—7 rue Henri Barbusse, Levallois (Seine).

TINNERMAN Speed Nuts®

MORE THAN 8000 SHAPES AND SIZES

Men of Industry

I. MELVILLE STEIN
. . . Leeds & Northrup president

HENRY C. BUCKINGHAM
. . . new president of Thor Corp.

A. G. WRIGHT
. . . heads Dominion Foundries & Steel

I. Melville Stein was elected president of **Leeds & Northrup Co.**, Philadelphia. Formerly executive vice president, he succeeds **Charles S. Redding**, who, after 14 years as president, becomes chairman of the board, a post vacant since the death of **Morris E. Leeds** in 1952. Other management changes include **D. H. Schultz**, secretary-treasurer, who succeeds Mr. Stein as executive vice president, retaining the duties of treasurer. **George W. Tall Jr.**, vice president, assumes the additional duties of secretary.

Bethlehem Steel Co., Bethlehem, Pa., appointed **Robert E. Wilmot** manager of structural sales to succeed the late **F. L. Stephenson**. **E. J. Marsten**, engineer in the erection department, retired after 50 years in structural steel design, fabrication and erection.

D. E. Gamble was named chairman of the supervisory board and **T. L. Knecht** president and general manager of Borg & Beck Division, **Borg-Warner Corp.**, Chicago.

George C. Foy takes over a newly created post of midwestern district manager for **Unistrut Products Co.**, Chicago.

Sterling Electric Motors Inc. made **Earl J. Phillips** district manager of a new sales office in Chicago.

Henry C. Buckingham is the new president of **Thor Corp.**, Chicago. He succeeds the late **John R. Hurley**. Mr. Buckingham has been vice president in charge of plant operations since 1948.

Arthur G. McKee & Co., Cleveland, announces retirement of **William A. Haven** as a vice president of the company. He has been in charge of the metals division and continues as a director of the company and as a consultant. With the McKee company many years, Mr. Haven is known for his consulting work in the iron and steel industry. Newly elected are **Merrill Cox** as vice president, metals division, administration and sales; and **A. L. Foell**, vice president, metals division, in charge of engineering. Mr. Cox was general sales manager of the division and Mr. Foell was technical director.

William A. Hopkins was appointed vice president in charge of manufacturing of **Bart Mfg. Corp.**, Bart Laboratories Co. Inc. and Bart Products Inc., Belleville and Newark, N. J. He was formerly sales manager of Bart-Messing Corp., an associated company. **Ray N. Griffin** was named vice president in charge of sales and advertising for Bart-Messing and associated companies.

Dominion Foundries & Steel Ltd., Hamilton, Ont., elected **A. G. Wright** president, **C. W. Sherman** honorary chairman, **F. A. Sherman** chairman, **F. A. Loosley** and **F. H. Sherman** executive vice presidents.

Thermal Research & Engineering Corp., Conshohocken, Pa., appointed **William K. Lombard** sales manager and **Charles W. Crawford** controller.

Herman L. Weckler was elected vice president-operations of **Clevite Corp.**, Cleveland. He retired in April from Chrysler Corp. where he was vice president, general manager and a director.

General manager of **Aeroquip Corp.'s** recently acquired plant at Van Wert, O., is **Don T. McKone Jr.**, former assistant general manager of Aero-Coupling Corp., Aeroquip's West Coast subsidiary.

Morse Chain Co., Ithaca, N. Y., appointed **Myron Hawley** factory manager, **S. Stuart Dickson** production planning superintendent, and **Walter C. Bass** manager of the Ithaca sales department. **M. V. Bailliere** was elected assistant secretary. He is also Ithaca plant controller.

New manager of the railroad track materials division for **Pettibone**

J. G. RICHARD HECKSCHER
. . . Budd commercial products mgr.

Mulliken Corp., Chicago, is **Walter A. Enstrom.**

J. G. Richard Heckscher will be responsible for operation of the new commercial products department established by **Budd Co.**, Philadelphia. He was named commercial products manager. **Fred T. Roberts** will be wheel products manager under Mr. Heckscher, and will continue headquarters in Detroit. **George E. Lallou,** treasurer of Budd Co., assumes additional duties of secretary.

John Dunn, formerly in charge of burner sales for **Peabody Engineering Corp.**, New York, was made general sales manager with responsibility for all divisions.

Paul L. Swoger was named midwestern sales manager, **American Metallurgical Products Co.**, operating out of Chicago. He was formerly connected with Jessop Steel Co. as a plant metallurgist, and previous to his new position represented Vanadium Alloys Steel Co. in Chicago.

Ralph H. Sartor relinquished his position as manager of sales, steel window and screen products, **Truscon Steel Division,** Youngstown, Republic Steel Corp., but continues as window products consultant.

Wallace M. Kunkel and **Ross C. Stevens** joined **De Walt Inc.**, Lancaster, Pa., subsidiary of American Machine & Foundry Co., as district sales managers. Mr. Kunkel's territory is the portion of New Jersey north of Trenton, Mr. Stevens' Connecticut and Westchester and Putnam counties in New York.

Ellis W. Ryan has become half owner and vice president-treasurer of **Ohio Machine & Boiler Co.**, Cleveland. Mr Ryan is also a director of Rausch Nut & Mfg. Co.

Milton Paisner was appointed district sales engineer of **American Silver Co. Inc.** in the New England states, working out of the Providence, R. I., office.

Fred A. Small was made regional sales manager in the southeast for **Breuer Electric Mfg. Co.**, Chicago.

George B. Meyer was made manager of the electronics section for aviation products at the Dayton, O., office of **Westinghouse Electric Corp.**

Allan B. Whitaker was named president of the newly formed **Crown Industries Inc.**, Owego, N. Y. He resigned from National Business Machines Corp.

Askania Regulator Co. appointed **Ralph Eads Jr.**, of **Eads Co.**, Houston, as its representative in Texas and Louisiana to succeed the late **Dean D. Ault**

In reorganization of **Brush Electronics Co.'s** sales division, **J. P. Arndt Jr.**, former manager of the crystal sales department, was made assistant general sales manager to succeed **A. J. W. Novak,** who is in a new post as head of all line sales activities including the equipment, tape recorder, component and international departments.

Frederick A. Shick has retired as comptroller and director of **Bethlehem Steel Corp.** and vice president and comptroller of Bethlehem Steel Co., Bethlehem, Pa. **R. H. Schlottman,** assistant comptroller, succeeds Mr. Shick.

John Alcorn was promoted to **Cooper Bessemer Corp.'s** foreign sales office at New York. He will devote his efforts to the sale of engine and compressor equipment outside the United States.

Effective Aug. 31, **Eugene H. Kling** resigns as general manager, **Klingrose Gravure Division,** American Type Founders Inc., Mt. Vernon, N. Y.

Bone Engineering Corp., Glendale, Calif., manufacturer of electroformed metal ducting aircraft parts and centrifugal investment castings, appointed **Edward G. MacLennan** sales manager.

A. P. Stuhrman was made manager of quality control, Pomona, Calif., division, **Consolidated Vultee Aircraft Corp.**

Robert S. Sagers was made manager, New England district, **Kennametal Inc.**, Latrobe, Pa.

Douglas Aircraft Co. Inc., Santa Monica., Calif., elected to the board of directors: **Donald W. Douglas Jr.,** vice president-military sales; **Nat**

J. P. ARNDT JR.

A. J. W. NOVAK

. . . positions at Brush Electronics

TRANSUE FORGINGS

USUALLY COST LESS AT THE POINT OF ASSEMBLY

High alloy steel aircraft forging weighs 5 lbs.; extreme care in heating the metal to proper forging temperature and forging to close tolerance are required.

Consult our engineers when you are contemplating conversion to forgings or when you are in need of reliable forging service.

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STEEL FORGING CORPORATION • ALLIANCE, OHIO

SALES OFFICES: NEW YORK • PHILADELPHIA • CHICAGO • INDIANAPOLIS • DETROIT • CLEVELAND

OVER 50 YEARS OF FORGING PRODUCTION EXPERIENCE

KARL KOEHN
. . . represents Commercial Contracting

NORMAN M. STED
. . . AS&W Cleveland district sales mgr.

MANLY B. BROWN
. . . joins Great Lakes Carbon

Paschall, vice president-commercial sales; and **Stanley G. Welsh,** member of the New York stock exchange. **W. E. Douglas** resigned from the board.

Commercial Contracting Corp., Detroit, appointed **Karl Koehn** as Pennsylvania representative to call on industrial firms in that area to present CCC's qualifications as industrial constructors and machinery installers. Other appointments include **M. C. Miller,** sales engineer, and **W. T. Browne,** sales representative-Ohio district. Mr. Miller was formerly with U. S. Steel Corp. for 43 years; Mr. Browne was with Republic Steel Corp. as manager of sales for 35 years; and Mr. Koehn was formerly with Mesta Machine Co. as field representative for 17 years.

S. T. Williams, formerly engineering manager, military division, Continental Motors Corp., joined **Rosan Inc.,** Newport Beach, Calif., as works manager.

Richard C. Martin was appointed sales director by **Kelite Products Inc.,** Los Angeles.

David E. Clark was made traffic manager of **Bohn Aluminum & Brass Corp.,** Detroit.

Don Lawless, specialist in light metals, joined **Sam Tour & Co. Inc.,** New York, as assistant director of the metallurgical department. He was previously with Kaiser Aluminum & Chemical Corp. and Reynolds Metals Co.

Norman M. Sted was appointed manager of sales for the Cleveland district of **American Steel & Wire Division's** sales department, U.S. Steel Corp. He succeeds **Paul B. Gilroy,** assigned to special duties on the staff of vice president-sales. An additional assistant district sales manager was named with appointment of **Harry F. McAnerney.**

Paul S. Nill was named controller for the San Diego division, **Consolidated Vultee Aircraft Corp.,** San Diego, Calif.

George A. Banton was made district manager of **Whitney Chain Co.'s** San Francisco office.

Truscon Steel Division, Republic Steel Corp., Youngstown, appointed **G. R. Roden** as manager of sales engineering window products and **A. L. Munsell** as manager of sales, dealer commodity products.

Rom Rhome was made manager of sales, southwestern region, for **Carlon Products Corp.,** Cleveland.

Hydraulic Press Mfg. Co., Mt. Gilead, O., appointed **W. M. Truska Jr.** as European sales representative for its new manufacturing center in the Netherlands.

Reliable Spring & Wire Forms Co., Cleveland, appointed **John B. Malloy** chief engineer. During the last 24 years he has been associated with Republic Steel Corp., Wheeling Steel Corp. and Cuyahoga Spring Co.

Manly B. Brown was elected vice president in charge of marketing of **Great Lakes Carbon Corp.,** New York. He had been with Republic Steel Corp. for 17 years, the last 13 of which he served as sales manager, pipe division. He will have headquarters in Chicago.

Fred Krugler was appointed plant superintendent, **Cleaver-Brooks Co.,** Milwaukee. He is succeeded as supervisor of assembly by **George Semrau. Chester Sellin** was made boiler fabrication supervisor and **Edward Hahn** supervisor of fabricated components.

Roger M. Blough was elected general counsel of **United States Steel Corp.,** New York, to succeed the late **Nathan L. Miller.**

International Business Machines Corp. appointed **Charles F. McElwain** to the staff of W. W. McDowell, director of engineering, at its world headquarters, New York.

Morey Machinery Co. Inc., New York, added **Fred A. Milnes** to its staff. He was with E. W. Bliss Co. where he spent a number of years as sales engineer and export sales manager. At Morey he will head the division of presses and kindred machinery.

Byron B. Burd was appointed metallurgist of **Damascus Tube Co.,** Greenville, Pa. He will also be in charge of product inspection.

C. Donald Steinwedel of Bristol, Va., joined **Carpenter Steel Co.'s**

the switch is to STAINLESS-CLAD PLATES

for lower costs... extension of material supplies

More and more, economy-minded buyers are switching to Stainless-Clad Steel Plates as an effective means of extending supplies of critical materials and of beating the high cost of stainless steel.

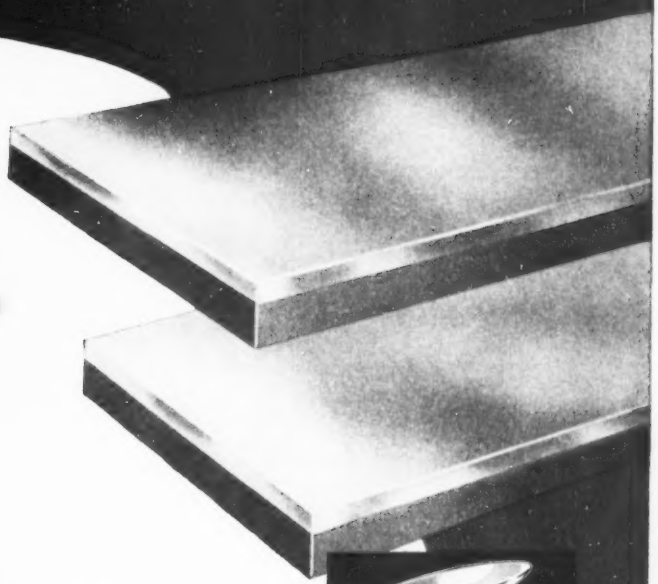
They find that in numerous types of fabrication these plates give them all the advantages of stainless steel, including high resistance to corrosion—yet with considerable savings in material costs.

Stainless-Clad Plates made by Claymont are a composite of stainless steel permanently bonded to carbon or alloy steel plate. They're easy to fabricate; will not buckle, crack or peel under the severest forming operations. Stainless cladding may be of any specified percentage of total plate from 10% to 50%.

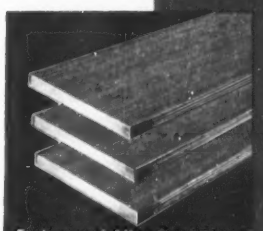
Other Claymont products include Flanged and Dished Heads, Alloy and Carbon Steel Plates, Large Diameter Welded Steel Pipe.

To order, write or call Claymont Steel Products Department, Wickwire Spencer Steel Division, Claymont, Delaware.

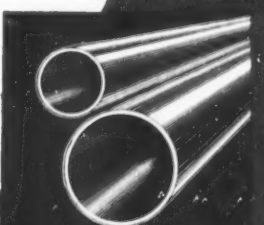
THE COLORADO FUEL AND IRON CORPORATION—Denver, Colorado
PACIFIC COAST DIVISION—Oakland, California
WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit
New Orleans • New York • Philadelphia
CANADIAN OFFICES: Toronto • Winnipeg • Edmonton • Vancouver



Flanged and Dished Heads



Carbon and Alloy Steel Plates



Large diameter steel pipe

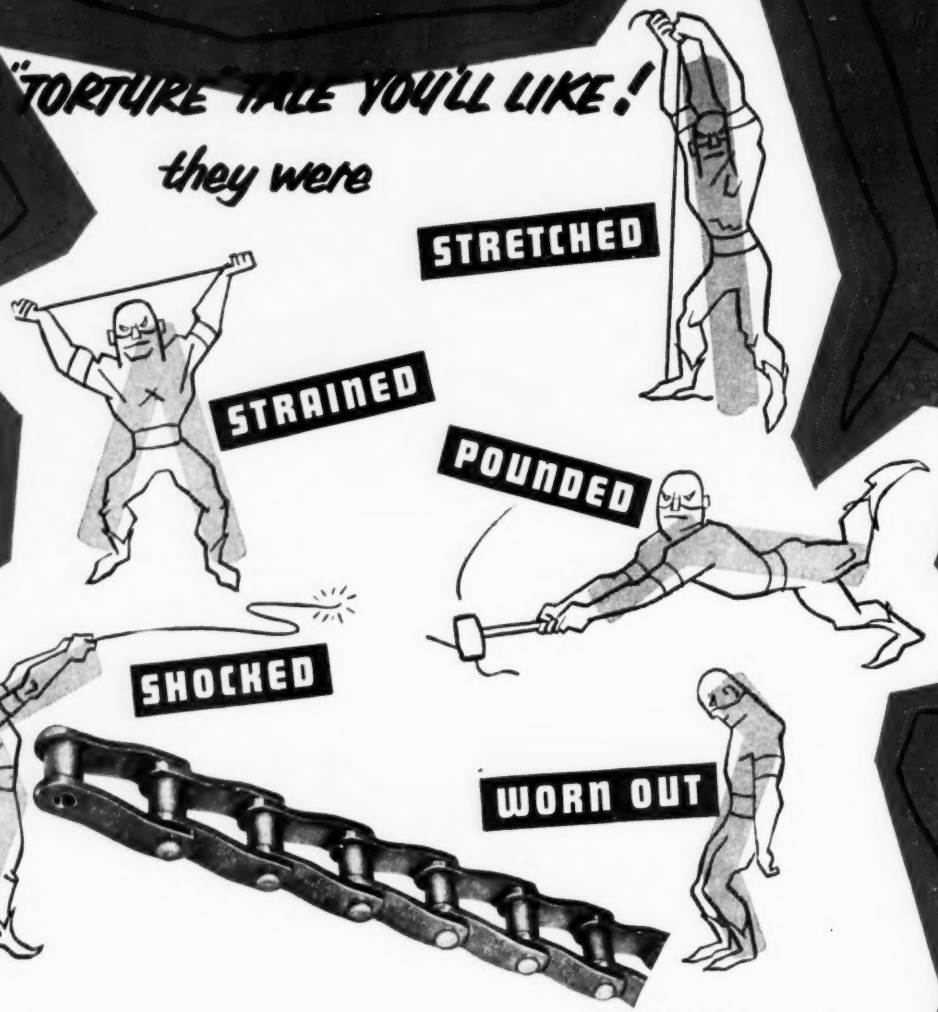
CLAYMONT STEEL PRODUCTS

PRODUCTS OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

CFI

THIS "TORTURE TALE YOU'LL LIKE!

they were



...and subjected to every conceivable test that a modern engineering "torture chamber" could devise. From it came a great new line of improved Rex Chabelco Steel Drive and Conveyor Chains. It wasn't easy because, as Chabelco users know, the previous Chabelco Chains were "tough," strong...hard to beat. But by making a few important design and manufacturing changes, Rex engineers produced a line of improved standard drive and conveyor chains. We call them Rex Chabelco "R" Series Drive and "RR" Series Conveyor Chains! You'll call them the best chains you've ever used!

Why not have your Rex Field Sales Engineer give you the complete story. Chain Belt Company, 4660 W. Greenfield Avenue, Milwaukee 1, Wisconsin.

CHAIN BELT REX COMPANY

Chain Belt COMPANY OF MILWAUKEE

Atlanta • Baltimore • Birmingham • Boston • Buffalo • Chicago • Cincinnati • Cleveland • Dallas Denver • Detroit • El Paso • Houston • Indianapolis • Jacksonville • Kansas City • Los Angeles • Louisville Midland, Texas • Milwaukee • Minneapolis • New York • Philadelphia • Pittsburgh • Portland, Ore. Springfield, Mass. • St. Louis • Salt Lake City • San Francisco • Seattle • Tulsa • Worcester

Distributors located in principal cities in the United States and abroad

EXPORT OFFICES: 4800 W. Mitchell St., Milwaukee 1, and 17 Battery Place, New York City

JOSEPH E. MAUREY
. . . Maurey Mfg. v. p.-gen. mgr.

GEORGE M. SZABAD
. . . heads TelAutograph Corp.

CARL L. SMART
. . . exec. v. p. Calstrip Steel

alloy tube division as sales representative in five southeastern states.

Joseph E. Maurey was promoted to vice president and general manager of **Maurey Mfg. Corp.**, Chicago. **Russell B. Malloy** was made national sales and export manager.

William T. Llewellyn is the new president of **S. L. Allen & Co. Inc.**, Philadelphia. He succeeds the late **Matthew J. Scammell.** New executive vice president is **Matthew J. Scammell Jr.** and treasurer is **Earle D. Appenzeller.**

C. E. Magoon was made treasurer and **W. R. Lenga** assistant treasurer, **National Tube Division,** U. S. Steel Corp., Pittsburgh.

Brown & Root Inc. announces creation of a mining and metallurgical division with offices in New York. Staffing the office will be **D. Moreno** and **E. H. Monroe.**

Robert Anderson was appointed to the newly created position of foundry engineer for **Hyster Co.**, Portland, Oreg.

TelAutograph Corp., New York, elected **George M. Szabad** president. He fills the vacancy created by resignation of **R. L. Spotts.**

Stephen M. Purcell was appointed assistant superintendent of the open-hearth department of **Lone Star Steel Co.**, Lone Star, Tex.

Raymond A. Frick was made vice president, **Brake Shoe & Castings Division,** American Brake Shoe Co., New York.

Robert C. Cheek was made assistant manager of engineering, electronics division, **Westinghouse Electric Corp.**, Baltimore.

Edgar J. Reichelderfer was made factory manager, **Sterling Engine Co.**, Buffalo.

W. J. Borwick was made Portland, Oreg., district manager for **U.S. Steel Supply Division,** U. S. Steel Corp.

Jerome D. Heibel and **Allen K. Shenk** were appointed vice presidents of **Erie Resistor Corp.**, Erie, Pa. Mr. Shenk is in charge of sales, Mr. Heibel in charge of research and engineering.

Carl L. Smart was named executive vice president of **Calstrip Steel Corp.**, Los Angeles. With the corporation since 1940, he has served as credit manager, traffic manager, secretary-treasurer, purchasing agent and vice president. **James L. Arthur** was named sales manager.

Martin Bayer was appointed to the newly created post of regional sales manager for the Philadelphia-South Jersey area by **Eastern Brass & Copper Co. Inc.**

W. F. Heffernan was placed in charge of the newly established New York district sales office of **Southwest Welding & Mfg. Co.**, which is located at 11 W. 42nd St.

Farrel-Birmingham Co. Inc. appointed **Gerald R. Gonyer** manager of its Chicago office to succeed **Harry Temporal** who retires in September.

John H. McVey, district engineer of **The Austin Co.** in southern California since 1944, was named district manager succeeding **R. E. Ward,** who continues as a vice president.

OBITUARIES . . .

Walter J. Hanson, 67, president, **Allis Foundry Products Inc.**, Milwaukee, died July 26.

Clarence W. Griswold, 77, chairman of the board and former president, **Sidney B. Roby Co.**, Rochester, N. Y., died July 23.

Robert W. Dommes, 65, founder and owner of **Eureka Welding Co.**, Scranton, Pa., died July 23.

James M. O'Neill, 60, manager of structural sales for **Morris, Wheeler & Co.**, Philadelphia, died July 23.

Benjamin P. Greene, 90, board chairman of **Eastern Machine Screw Corp.**, New Haven, Conn., died July 23.

J. J. Russell, 67, chairman of the board of **Revere Copper & Brass Inc.**, New York, died Aug. 1. He was with the company for many years and previously served as its president.

Brainard Steel Expands

New facilities will triple company's capacity for making strapping and other items

BRAINARD STEEL DIVISION, Sharon Steel Corp., Warren, O., awarded contracts for construction of a plant which will triple the company's capacity for making steel strapping and other items.

The plant will add 75,000 sq ft of manufacturing space to Brainard's present strapping facilities. It will embody continuous production lines for finishing operations, including slitting, strip painting and multiple-strip electrogalvanizing. The latest techniques in mechanized materials handling and warehousing will be employed.

Orders Placed — Production equipment has been on order for several months. The plant is scheduled to be completed and equipped by Feb. 1, 1954. The present Brainard strapping plant, which has 95,000 sq ft of floor space, will continue in operation.

Brainard manufactures a complete line of steel strapping, strapping tools and accessories, covering over 1000 different items. The division also makes welded steel tubing, tubular steel scaffolding and a line of steel building products.

Gairing Acquires Drill Line

Gairing Tool Co., Detroit, acquired outright the line of interchangeable spade drills and core drills formerly made by Conner Tool & Cutter Co., that city. The transaction includes trade name, manufacturing facilities and inventory. All manufacturing operations have been moved to the Gairing plant.

Allied Specialties Co. Formed

A new small business production pool, incorporated as Allied Specialties Co., 1534 Pratt St., Philadelphia, has been organized to seek defense contracts in the metalworking field. It is primarily interested in producing machine parts and tools. Members of the pool, all located in Philadelphia, are: Arrow Tool, Die Machine Co.; Barta Machine Co.; Comly Machine Co.; Eastern Non-Ferrous Foundry Co.; Emerald Tool & Die Co.; Industrial Specialties Co.; Kosempel Mfg. Co.; H. J. Perazzoli & Co.; Quaker Storage Co. Inc.; and Wichterman & Weber.

Named to NIAA Board

Mrs. Lee S. Worthington, director of advertising and secretary of Tranter Mfg. Inc., Lansing, Mich., is the first woman ever named a director of National Industrial Advertisers Association, New York.

Mrs. Worthington is a member of the board of directors, Tranter Mfg., manufacturer of commercial heating and refrigeration equipment and highly technical industrial products. She is also a member of the Direct Mail Advertisers Association; Advertising Round Table of Southern Michigan; American Federation of Advertisers.

MRS. L. S. WORTHINGTON

Luria Gets Foreign Trade Firm

Livingston & Southard Inc., New York, has become a division of Luria Bros. & Co. Inc., iron and steel scrap brokers, Philadelphia. Livingston & Southard is an exporting and importing concern specializing in prime and secondary steel products, nonferrous metals, scrap and other industrial raw materials. In addition to these activities, the division will undertake all international dealings for the Luria organization.

Macco Products Co. Expands

Macco Products Co., Chicago, is building a $350,000 plant on Sangamon street, that city. The company produces special drawing and cutting oils, cleaning and rustproofing solutions and many other compounds for steel processing.

Kaiser Opens Spokane Office

Kaiser Aluminum & Chemical Corp. established its northwest operations office at 505 Spokane and Eastern building, Spokane, Wash. Norman L. Krey is manager.

Bearings Firm Names Agent

Edwards Sales Agency, St. Louis, is the newest distributor and exclusive sales representative for Miniature Precision Bearings Inc., Keene, N. H., manufacturer of miniature bearings for instruments and precision mechanisms.

Graybar Electric Opens Branch

Graybar Electric Co. Inc., New York, will open a branch at 1140 N. Irwin Ave., Green Bay, Wis., this month. John W. Peterson will be manager of the branch. The company is a distributor of electrical supplies.

Carbon Malleable Renamed

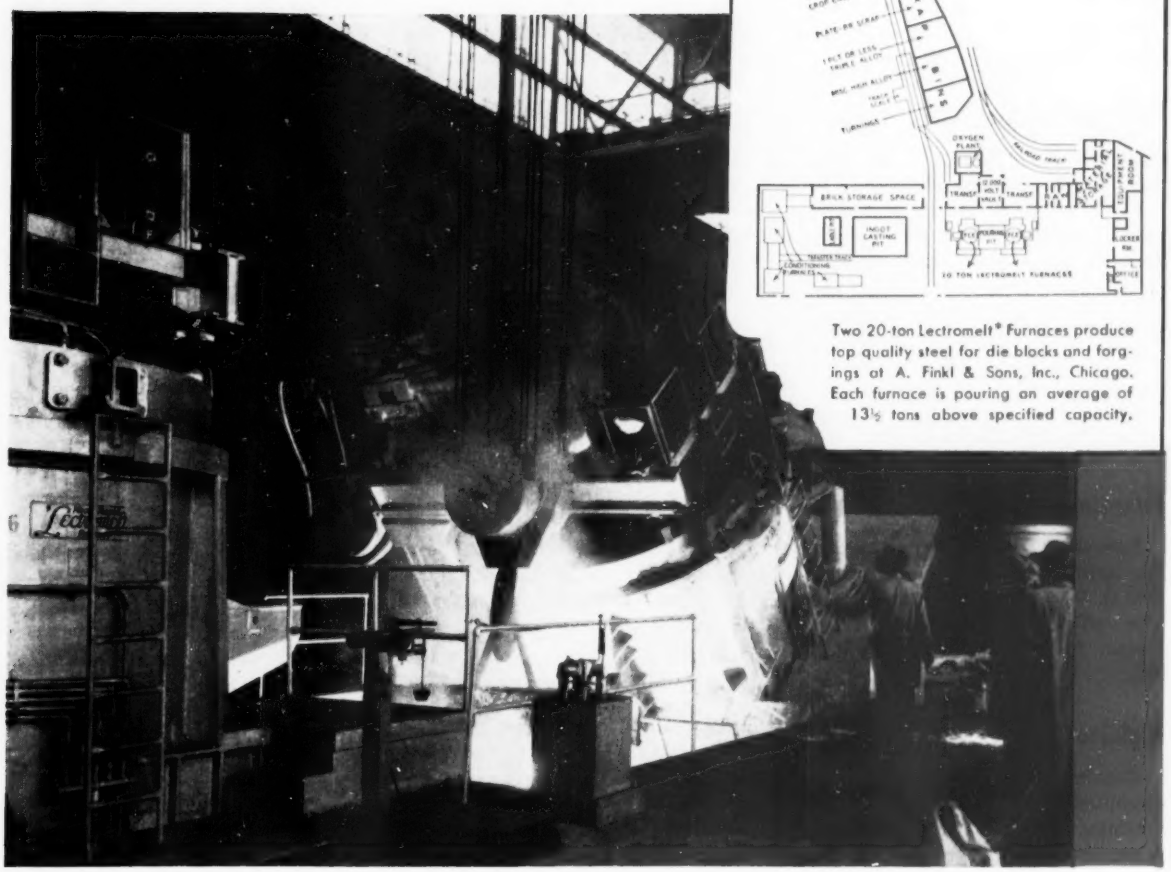
Carbon Malleable Casting Co. Inc., Lancaster, Pa., changed its name to Pennsylvania Malleable Iron Corp. President of the firm is Charles P. Speitel.

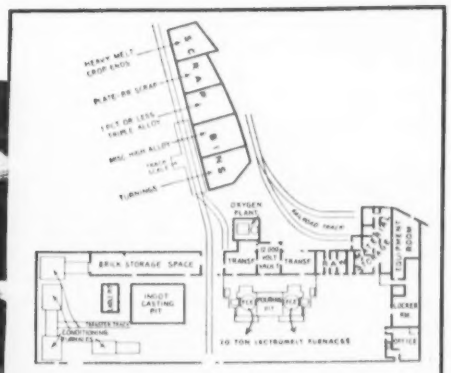
Feedall Machine Moves

Feedall Machine & Engineering Co., builder of automatic hopper feeds and similar selector devices, moved to its new plant at 38399 Pelton Rd., Willoughby, O. The building more than doubles the capacity of its former plant.

Association Adds Two Locals

National Association of Corrosion Engineers, Houston, added two local sections to its organiza-





Two 20-ton Lectromelt* Furnaces produce top quality steel for die blocks and forgings at A. Finkl & Sons, Inc., Chicago. Each furnace is pouring an average of 13½ tons above specified capacity.

rated at 20 tons, Averaging 33½ tons in Finkl's new melt shop!

"They're sturdy," says Dave Hughes, Finkl's Melt Shop Superintendent, "so we felt safe in boosting the output of these two 20-ton Lectromelt Furnaces to as high as 40 tons. Our monthly average has been 33½ tons."

Finkl's Lectromelt Furnaces top-charge in 6 minutes . . . pour heats in 3½ to 4½ hours. Downtime between heats is only 25 minutes.

Your furnaces are the heart of your melting, smelting or reduction operation. They can be sturdy and dependable. Write for Bulletin No. 9 describing Lectromelt Furnace operation. The Pittsburgh Lectromelt Furnace Corporation, 323 32nd Street, Pittsburgh 30, Pennsylvania.

Manufactured in . . . CANADA: Lectromelt Furnaces of Canada, Ltd., Toronto 2 . . . ENGLAND: Birlec, Ltd., Birmingham . . . FRANCE: Stein et Roubaix, Paris . . . BELGIUM: S. A. Belge Stein et Roubaix, Brossoux-Liege . . . SPAIN: General Electrica Espanola, Bilbao . . . ITALY: Forni Stein, Genoa. JAPAN: Daido Steel Co., Ltd., Nagoya

*REG. T. M. U. S. PAT. OFF.

MOORE RAPID

WHEN YOU MELT... Lectromelt

tion: Columbia River Basin section and the British Columbia section. The association now has more than 4300 members in the United States and abroad.

Chicago Pneumatic Buys Jacobs

Chicago Pneumatic Tool Co., New York, acquired the assets of Jacobs Mfg. Co., West Hartford, Conn., manufacturer of chucks. Manufacturing and sales operations will not be affected by the sale and will be carried on without change by a wholly-owned subsidiary of Chicago Pneumatic called Jacobs Mfg. Co., a New Jersey corporation. G. J. Coffey is president of the parent firm.

Interstate Steel Opens Branch

Interstate Steel Co., Evanston, Ill., established a sales office at 208 E. Wisconsin Ave., Milwaukee. The office is headed by Frank Lyons, formerly of Allis-Chalmers Mfg. Co., West Allis, Wis.

Rigidized Metals Names Agent

Rigidized Metals Corp., Buffalo, appointed Chicago Steel Service, Chicago, as distributor of its three-dimensional, design-strengthened Rigid-Tex metal.

Bearings Firm Changes Hands

Universal American Corp., New York, purchased the controlling interest in Norma-Hoffman Bearings Corp., Stamford, Conn. Universal, headed by Francis S. Levian, made the purchase from Hoffman Mfg. Co. Ltd., Chelmsford, England. Transfer of the ownership of the bearings company ended British control which had been in effect for nearly 30 years. Norma-Hoffman will continue to operate as a separate company.

Northern Engineering Expands

Northern Engineering Works, Detroit, manufacturer of overhead electric traveling cranes and other materials handling equipment, is constructing a 20,000 sq ft assembly building. The company also is modernizing and expanding its fabricating facilities throughout the plant.

Alloy Rods Builds Factory

Alloy Rods Co., York, Pa., is constructing a plant in El Segundo, Calif., to be known as its Pacific Coast Division. The plant will produce alloy arc welding electrodes and is expected to be in full operation by Oct. 1. It will be under the supervision of George M. Hohmann who is now the production manager of the York plant. The latter plant is being enlarged to double existing production facilities.

Goodrich Welding Moves Plant

Goodrich Welding Equipment Corp. moved its entire operation from Reed City, Mich., to Hudsonville, Mich., where a factory with 19,800 sq ft of manufacturing and 2320 sq ft of office space is being completed. The company manufactures resistance welding equipment, transformers for such work, automatic production machines, jigs, fixtures and welded fabrications.

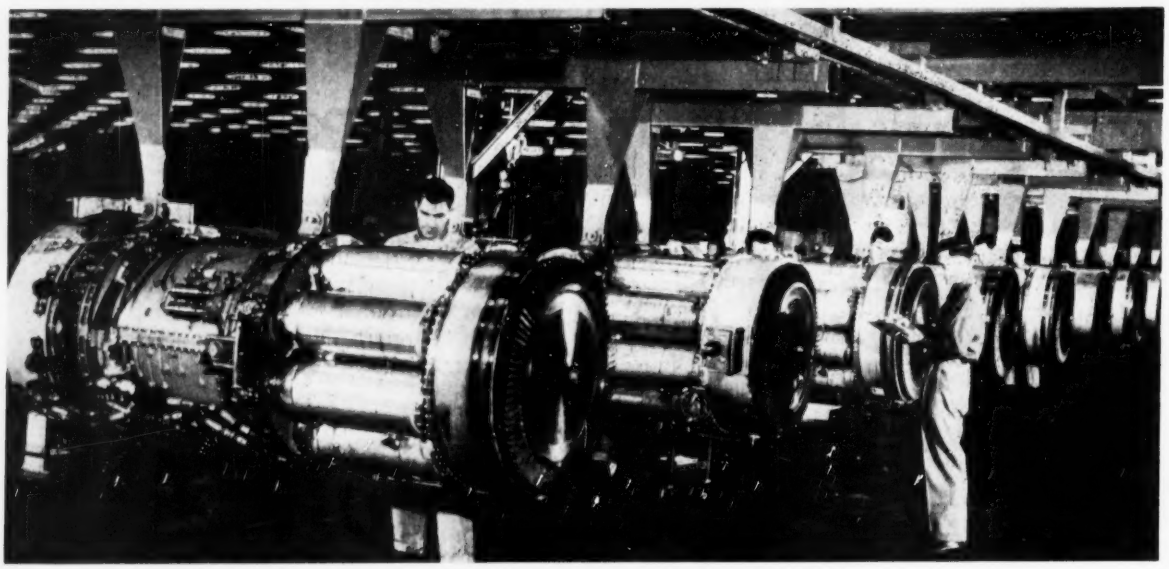
Aluminum Warehouse Opened

Architectural Aluminum Co., Seattle, distributor for Aluminum Co. of America, opened its office and warehouse at 1250 Mercer St., that city. The firm also stocks aluminum shade screenings produced by Kaiser Aluminum & Chemical Corp., Oakland, Calif.

Webb Moves to Larger Quarters

Jervis B. Webb Co., of California, manufacturer of conveyors, moved its general offices and fac-

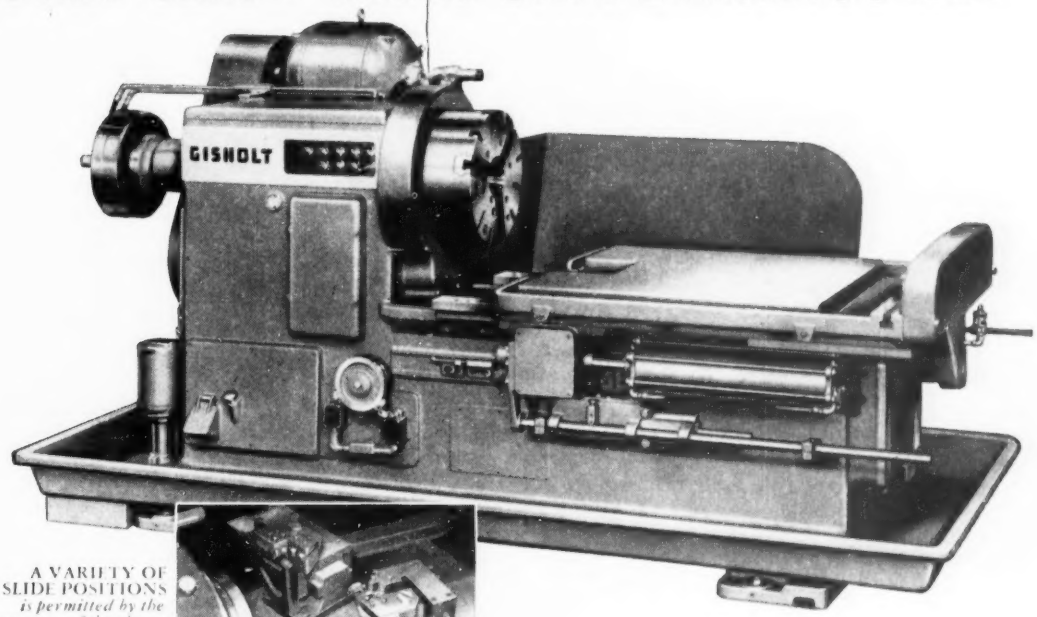
(*Please Turn to Page* 87)

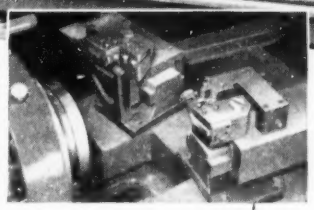


Workers Assemble Engines on "Grape Arbor" Production Line

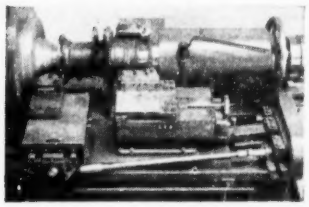
A completely mechanized assembly line was installed recently at General Electric Co.'s plant near Cincinnati to speed up production of J-47 jet engines for Air Force and Navy planes. It is called a "grape arbor" because the engines hang from an overhead conveyor as shown above. The industrial "grape arbor" innovation permits automatic engine movement from station to station, allowing the worker to concentrate fully on assembling the engine parts

What CAN'T these SIMPLIMATICS do?

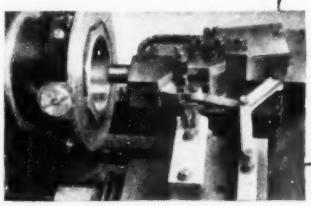




A VARIETY OF SLIDE POSITIONS *is permitted by the large area of the platen table. Angular feeds are no problem. Compound slides are unnecessary.*



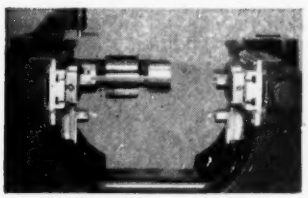
TAILSTOCKS *can be mounted on platen table for between-centers work; can be operated by hand or pneumatically.*



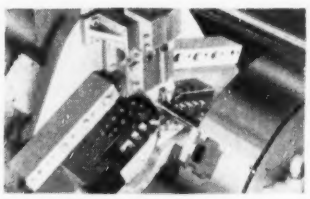
A LINKAGE ARRANGEMENT *between the slides can be used for spherical boring in conjunction with facing and turning.*

It's this simple basic design that makes the Simplimatic so readily adaptable to solve a variety of machining problems. It's a standard machine—yet it can be individualized to give you the high speed production of an automatic lathe designed solely for the job at hand. Think of the difference in cost.

The adaptations shown here are only a few of the almost unlimited possibilities of the Simplimatic. When you have a "special" job of machining parts in large volume, look into the Simplimatic before you build a special machine. The chances are good you'll save time and money.



SIMULTANEOUS DOUBLE END MACHINING *is possible with full utilization of base machine.*



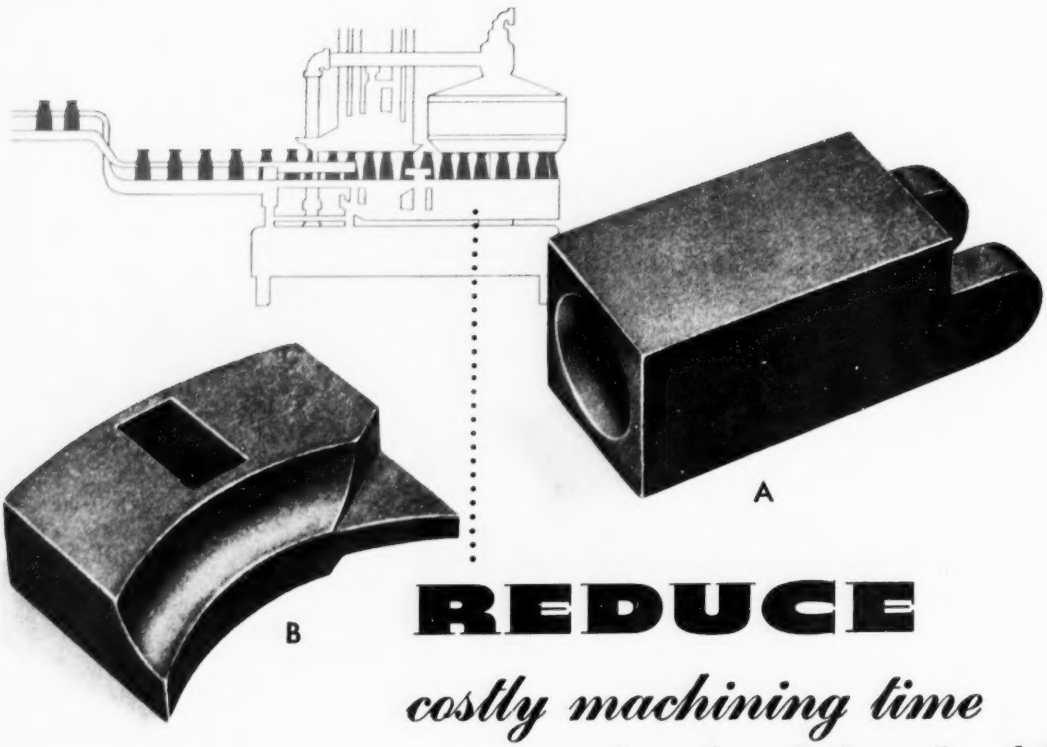
VERTICAL HEAD. *Tool slides can also be mounted on a vertical instead of horizontal platen. A choice of arrangements is possible.*

THE GISHOLT ROUND TABLE *represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.*

GISHOLT MACHINE COMPANY

Madison 10, Wisconsin

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES



REDUCE

costly machining time and extend product life

with Crucible ACCUMET Precision Investment Castings

Where parts are intricate or machining difficult, substantial savings can be made by using Crucible Accumet Precision Investment Castings.

The Type 303 Stainless castings shown above (A & B), for example, eliminated practically all expensive machining operations for a manufacturer of milk bottling machinery.

In many cases life of component parts can be greatly extended by using castings of high-alloy grades impractical to machine. The ring illustrated (casting C), used in a fine wire feed mill, is an investment casting made of Crucible *Rexalloy*, a non-ferrous cobalt-chromium-tungsten alloy steel providing exceptional wear and abrasion resistance.

Crucible engineers and metallurgists are available to help you solve design problems or lower production costs with Accumet Precision Investment Castings. Write now for further information.

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53 *years of Fine steelmaking*

ACCUMET PRECISION CASTINGS

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REX HIGH SPEED • TOOL • REZISTAL STAINLESS • ALLOY • MAX-EL MACHINERY • SPECIAL PURPOSE STEELS

(*continued from Page* 84)
tory to larger quarters at 9301 Rayo Ave., South Gate, Calif.

Distributorship Changes Hands

Iowa Ford Tractor Co., Des Moines, Iowa, farm equipment distributorship formerly owned by Dearborn Motors Corp., Birmingham, Mich., is operating as an independent distributorship under new ownership and management. G. D. Andrews resigned his position as vice president in charge of sales for Dearborn Motors to become one of the owners, president and general manager of the new Iowa Ford Tractor Co.

Avco Buys Canadian Firm

Avco Mfg. Corp., New York, acquired the appliance manufacturing company, Moffats Ltd., Weston, Ont. The plant will be operated by a subsidiary company, Avco of Canada Ltd. which will take over also the parent company's Canadian subsidiaries, Bendix Home Appliances Canada Ltd. and Crosley Radio & Television Ltd. The latter firms will be operated as divisions while Moffats Ltd. will be operated as a subsidiary of Avco of Canada Ltd. Victor Emanuel, chairman and president of Avco Mfg. Corp., is president of Avco of Canada.

Royal Vacuum Cleaner To Move

Royal Vacuum Cleaner Co., Cleveland, plans to move its main office and plant to Newport, Ky., in about three or four months. Operations will be carried on at 2011 Eastern Ave. and at 1024 Saratoga St., that city. Production is to begin soon on a new canister cleaner.

Wright-Hibbard Names Agents

Wright-Hibbard Industrial Electric Truck Co., Phelps, N. Y., appointed as its distributors: R. E. Condit Co., Columbus, O.; Machine Tool Sales, Chicago; Nook & O'Neill Inc., Cleveland; and Stokes Equipment Co., Philadelphia. Wright-Hibbard substantially increased production of fork lift and platform trucks since its reorganization last year.

John Oster To Enlarge Plant

John Oster Mfg. Co., Racine, Wis., will build a $350,000 addition to its Milwaukee plant. It will add 65,000 sq ft of floor space and is scheduled for completion by early 1954. The company makes fractional horsepower electric motors, food and drink mixers, hair clippers and driers, and massage instruments.

Engineering Firm Expands

Designers for Industry Inc., creative product engineering firm, expanded its engineering and research facilities by leasing 8000 sq ft in a building at 3107 Detroit Ave., Cleveland, a few hundred feet west of its main engineering building at 2915 Detroit Ave. The company is carrying on extended development and fabrication of electronic computers and special mechanical handling equipment.

Canada To Build Minesweepers

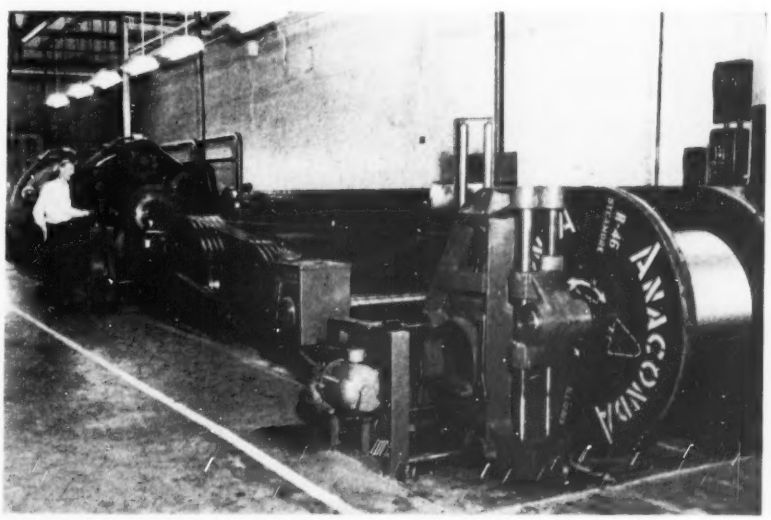
Contracts will be awarded to Canadian shipbuilding yards for construction of six minesweepers for the Royal Canadian Navy. These vessels are in addition to the 14 minesweepers now under contruction. Participating companies are: Davie Shipbuilding & Repairing Co. Ltd. and Geo. T. Davie & Sons Ltd., Lauzon, Que.; Marine Industries Ltd., Sorel, Que.; Port Arthur Shipbuilding Co. Ltd., Port Arthur, Ont.; Victoria Machinery Depot Co. Ltd. and Yarrow Yards Ltd., Victoria, B. C.

Johnson & Hoffman Mfg. Moves

Johnson & Hoffman Mfg. Co. moved its offices and plant to larger quarters at 31 E. Second St., Mineola, N. Y.

Challenge Observes Milestone

Challenge Machinery Co. marked its 50th anniversary of manufacturing in Grand Haven, Mich., June 29. The company first started in Chicago in 1870 as an electrotype foundry under the name of Shniedewend & Lee. In 1893 the firm was reorganized as Challenge Machinery Co. and moved to Grand Haven in 1903. Challenge products now include paper cutters, paper drills, printing and proofing presses, quoins and keys, iron furniture and other printing equipment, plus a line of precision equipment for the metalworking industries. Officers are: President, J. Edgar Lee; executive vice president, J. Wesley Lee; treasurer,



Aluminum Wire and Cable Output Boosted

New facilities for making aluminum wire and cable include this 66-wire stranding machine recently installed at the Sycamore, Ill., mill of Anaconda Wire & Cable Co., New York. The machine is shown stranding ACSR cable (a type used extensively in overhead lines for transmission and distribution). This and similar machines due to be installed at Sycamore and other Anaconda mills around the country should help considerably in serving needs of the industry

Ralph G. Wilson; secretary, E. Paul Babcock.

Wisconsin Motor Buys Plant

Wisconsin Motor Corp., Milwaukee, manufacturer of heavy-duty air-cooled engines, purchased a plant in that city formerly occupied by Sterling Motor Truck Co. The latter company was absorbed by White Motor Co. which subsequently moved the Sterling operation to Cleveland. The plant will provide facilities for a 60 per cent increase in Wisconsin Motor's production. Harold A. Todd, president, says that Wisconsin Motor's air-cooled engine sales have increased 2000 per cent since 1940.

Moves Claymont Steel Offices

Sales offices of Claymont Steel Products Department, Wickwire Spencer Steel Division, Colorado Fuel & Iron Corp., are being moved from the mill at Claymont, Del., to 813 West St., Wilmington, Del.

Fletcher Aviation To Build

Fletcher Aviation Corp., Pasadena, Calif., will construct a plant for manufacture of aircraft jettisonable fuel tanks and airplanes at 9400 E. Ramona Blvd., Rosemead, Calif. Wendell S. Fletcher, president, says completion is scheduled by November.

Pittsburgh Firms Move

General offices of Standard Boiler & Plate Iron Co., Furnace Engineers Inc., Brassert Corp. and Niles Construction Co. were moved to the Union Bank building, Pittsburgh 22.

Connor Spring Mfg. Expands

Connor Spring Mfg. Co., Los Angeles, is constructing a plant addition for manufacture of precision springs.

Castle Enlarges Warehouse

A. M. Castle & Co. is expanding its Chicago steel warehouse facilities at 1132 W. Blackhawk St. by construction of an addition which will provide some 34,000 sq ft of floor space. Completion is scheduled for November. In the last two years the company has widened the size range of the products it handles, requiring additional space to augment inventories.

Willys' Vehicle Is Boon to Deliverymen

Willys Motors Inc., Toledo, O., is producing a Jeep-like vehicle that features right-side steering. It has conventional two-wheel drive traction. The unit, undergoing tests at the Toledo post office, is being used on mounted carrier routes in suburban areas for regular mail collections and for distribution of special delivery mail. Using the vehicle, above, is T. E. Montgomery

New equipment to be installed will include overhead cranes and shears.

Houghton Appoints Distributors

Houghton Laboratories Inc., Olean, N. Y., manufacturer of Hysol products, appointed as its representatives: Servisales Co., Cleveland; John S. Plewes Co., Toronto, Ont.

Iron Works Marks 125th Year

Cornell Iron Works Inc., Long Island City, N. Y., manufacturer of rolling doors, rolling grilles, fire doors and other upward acting closures, sliding grilles, and escalator enclosures celebrated its first century and a quarter in business on July 24. The firm developed rapidly into one of the country's largest iron works and at one time used 10 per cent of the structural steel rolled by American mills, being the largest customer of Carnegie Steel Co.

Walsco Starts Manufacturing

Walsco Electronics Corp., Los Angeles, started manufacturing television antennas at 3602 Crenshaw Blvd. Walter L. Schott is president.

Firm Adds Ferroalloy Products

Reading Chemicals, Wyomissing, Pa., which started manufacture of ferrotungsten three months ago, is adding ferrotantalum-columbium and ferrotitanium to its products. William D. Crawford, since 1951 on the staff of the Ferroalloys Branch, Iron and Steel Division, NPA, is sales manager. Fred Perfect, formerly research chemist, Beryllium Corp. of America, Reading, Pa., is superintendent of production. The new company plans to incorporate shortly.

Barber-Colman Opens Branches

Automatic Control & Uni-Flo divisions of Barber-Colman Co., Rockford, Ill., opened a factory branch office at 218 Harrison St., Syracuse, N. Y., with K. C. Watson as manager. The firm opened another one at 1143 Mary St., Jacksonville, Fla., with D. W. Minick as manager. Both offices will

(Please Turn to Page 90)

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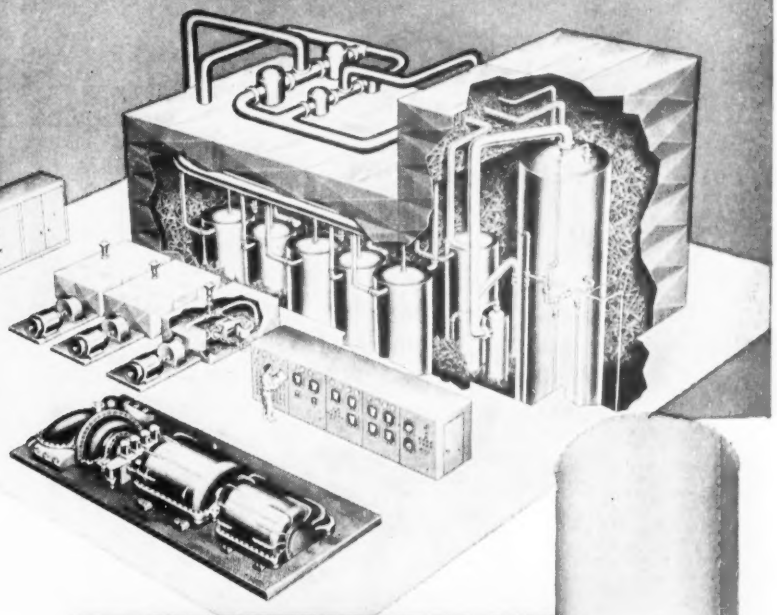

A typical Air Products Tonnage Oxygen-Nitrogen Generator in operation since February, 1951. Oxygen capacity, 450 tons per day

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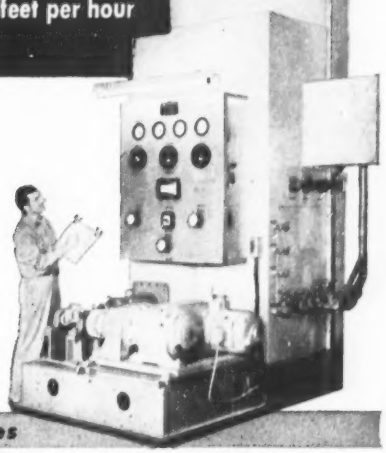

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(Continued from Page 88)

handle the sale and service of automatic control and air distribution products.

Iron Powder Plant Opened

Easton Metal Powder Co., Easton, Pa., is operating a new plant for the production of iron powder. The plant uses the RZ process, resulting in production of high grade iron powder which can be controlled to meet the requirements for various applications, such as sintered iron and steel parts, sintered magnets, flame cutting, coating for welding electrodes and many other specialized industrial processes using finely divided iron. Dr. Gerhard Wagner is president with offices in New York.

Allis-Chalmers Names Agent

Allis-Chalmers Mfg. Co., Milwaukee, appointed as a distributor for its motors, controls and transformers John L. Callaway Co., Anniston, Ala. Allis-Chalmers also named Flushing Electric Corp., Flushing, N. Y., a distributor, as a certified service shop.

Curtis To Build Larger Machines

Curtis Machine Division, Lincoln Park Industries Inc., Jamestown, N. Y., will erect a new assembly area to provide space for a 10-ton overhead crane, enabling the plant to build larger machines. A building will extend off the assembly area, providing space for a welding and fabrication shop.

Aerol Co. Moves Facilities

Aerol Co. Inc., Los Angeles, is moving its foundry and machine shop to 2500 San Fernando Rd. The company manufactures industrial wheels and casters under the direction of Harry L. Oppenheimer, president.

New Firm Makes Wire Frames

Scranton Wire Frame Co. Inc., Scranton, Pa., a new firm, has begun production of wire frames. The company is occupying about 10,000 sq ft of leased floor space and has extensive expansion plans which

call for the manufacture of all lines of wire products. The firm will operate its present facilities as a pilot plant for the present time. If plans materialize, the firm will eventually erect its own Scranton plant with about 50,000 sq ft of floor space.

Morton Bearing Co. Moves

Morton Bearing Co., Ann Arbor, Mich., manufacturer of bearings, moved to larger quarters at 815 Wildt St., that city.

Acquires Control of Brownhoist

Pennsylvania Coal & Coke Corp., New York, acquired control of Industrial Brownhoist Corp., Bay City, Mich., in a new move toward diversification. Industrial Brownhoist makes earth-moving equipment and caters to the mining industry.

Harry Ferguson Names Agents

Harry Ferguson Inc., Detroit, appointed as distributors of its tractor and farm implement line: Kern Farm Equipment Ltd., Regina, Sask., replacing Melfort Motors Ltd.; Huggard Farm Implements Co. Ltd., Winnipeg, Man., replacing Leonard & McLaughlin Motors Ltd.

IBM Plans Expansion

International Business Machines Corp. will consolidate some of its engineering activities now located outside its laboratory in Endicott, N. Y. The firm is making arrangements for construction and leasing of two buildings west of Endicott covering 40,000 sq ft. The buildings are scheduled for completion in the fall and the plot on which they will be located will allow for future expansion.

Wesdon Engineering To Build

Wesdon Engineering Co., Utica, N. Y., purchased property in New York Mills, N. Y., for erection of a plant. The firm operates a general machine shop and does special jobs and some tool and die work. The company expects to handle heavier type contracts at the new location.

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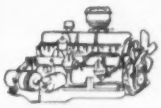

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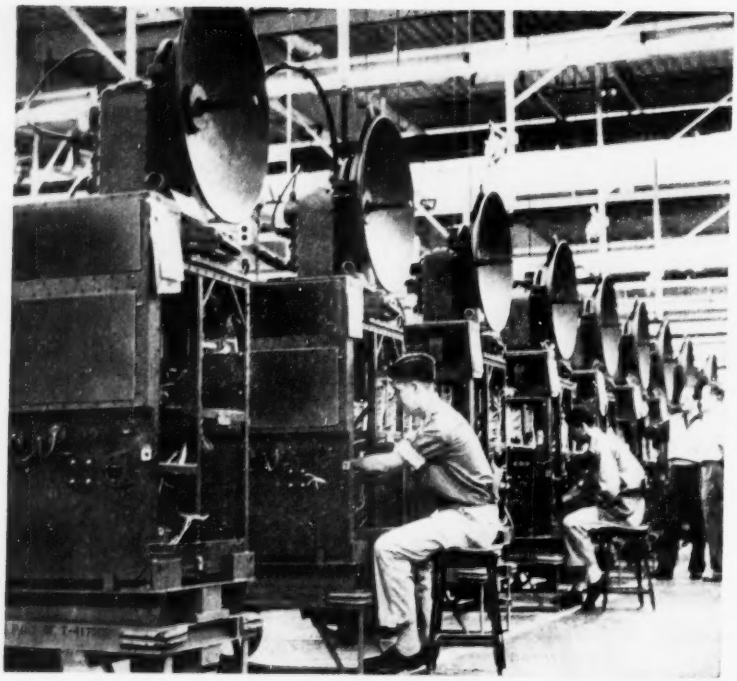
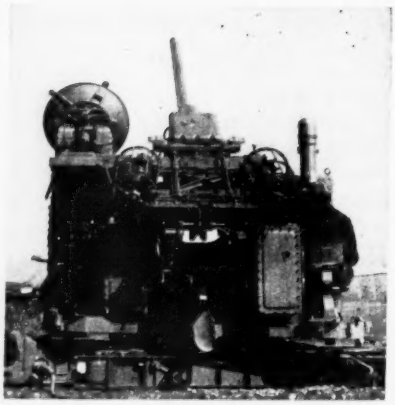


Skysweeper fire control systems on the assembly line at Sperry Gyroscope Co.



The Skysweeper—control unit at left

Perfection in Packaging:

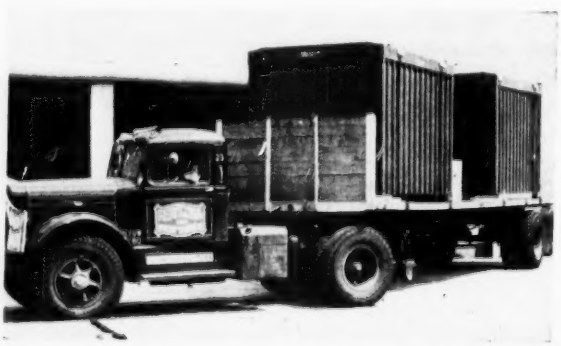
Sperry Fire Control Units Ride in Style

Fork truck loads heavy components into Transportainer

HEAVY, FRAGILE fire control systems for the Army's Skysweeper antiaircraft gun have to arrive at destinations half way round the world in perfect working order. Sperry Gyroscope Co., Great Neck, N. Y., manufacturer of the delicate 3-ton units, found the packaging answer in a modified Transportainer, a welded steel box originally developed by Dravo Corp., Pittsburgh, for cargo protection in trans-oceanic shipping.

Standard Transportainers are modified in dimensions and fitted with special channels and framework to receive components of the fire control units. Plastic dust covers are the only other packing materials needed. To make packaging almost foolproof, each separate component is secured within the Transportainer by fittings which accommodate that component only. Packing time is three hours, compared to an estimated two days by woodcrating methods. The containers are reusable, may be stacked three high, and are weatherproof.

Fire control unit stored, each part in a special place



Two fire control systems off for overseas defense role

CONTINENTAL

SHOP ASSEMBLY OF A 46" BLOOMING-SLABBING MILL AND 56" TANDEM COLD STRIP MILL AT EAST CHICAGO PLANT

Complete Rolling Mill Installations

SLABBING MILLS	Mills complete with Auxiliary Equipment	BLOOMING MILLS
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PLATE MILLS	★ ★ ★	RAIL MILLS
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COLD STRIP MILLS	ROLL LATHES	ROD MILLS
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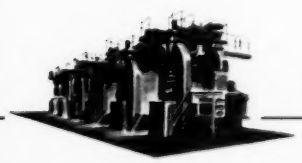
CASTINGS—carbon and alloy steel from 20 to 250,000 pounds.

ROLLS—iron, alloy iron and steel rolls for all types of rolling mills.

WELDMENTS—fabricated steel plate, or cast-weld design.



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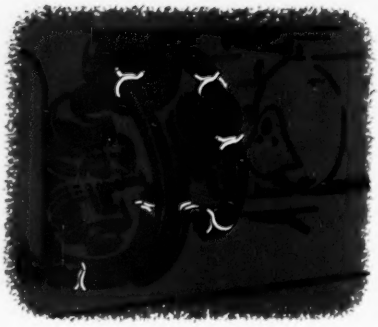

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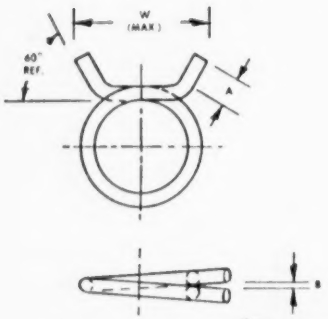

Eaton Number	Size Hose O. D.	Wire Diameter	"A" Dimension	"B" Dim. (Max.)	"W" (Max.)
ER 6	3/8	.082	1/4 — 5/16	1/32	3/4
ER 10	5/8	.107	1/4 — 5/16	1/32	1
ER 13	13/16	.117	1/4 — 5/16	1/32	1 1/8
E 9	15/16	.122	1/4 — 5/16	1/32	1 1/4
E 10	1	.132	1/4 — 5/16	1/32	1 11/32
ER 18	1 1/8	.152	5/16 — 3/8	1/32	1 7/16
E 16	1 3/8	.162	5/16 — 3/8	1/32	1 3/4
E 20	1 5/8	.172	5/16 — 3/8	3/64	1 7/8
E 26	2	.177	5/16 — 3/8	1/16	1 15/16
E 30	2 1/4	.182	5/16 — 3/8	3/32	2 1/8

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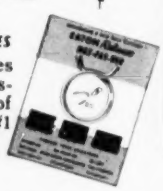

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STEEL
August 10, 1953

Technical Outlook

BORIDES GROW—High purity boron and borides are being made by a new process. One of the compounds, titanium boride, comes close to being the hardest man-made substance known. Another, zirconium boride, melts at about 5400°F. Copper Metallurgical Associates, who are back of the development, say all the borides are comparatively inert over a wide temperature range, resist oxidation and have better thermal conductivity than carbides.

GETTING PRACTICAL—Research men at Minneapolis-Honeywell are sweating it out in more ways than one. They are studying the effect of perspiration on finishes. They brew their own perspiration using a variety of organic acids and salt. Problem is more important than you think. Perspiration can remove paint and etch metals.

HOT BOLTING—Producers of fasteners made with high-temperature alloys have been faced with this problem: Developing an economical method of manufacture that's thrifty with material. Cold heading looks like the best bet.

NICKEL SUB—A plated tin-copper alloy containing 10-12 per cent tin is being looked at to take place of nickel under chromium. Known as Nickelex the bright bronze coating can be plated directly on steel, brass and zinc die castings. It goes well over soldered and brazed parts. Corrosion resistance is being compared to an equivalent thickness of copper under chromium. On this score, there is some feeling that Nickelex may be better.

NEW TWIN—Cold-natured nickel shows promise for high-temperature work when coated with a ceramic, Oak Ridge National Laboratory reports. Nickel specimens were annealed in water-saturated hydrogen at 1000°F then sprayed with National Bureau of Standards ceramic coating A-418, dried and fired. Durability of coating was tested by heating specimens in an oxidizing atmosphere at 1500°F for 65 hours. Verdict: Coating improved in adherence and specimens retained good appearance.

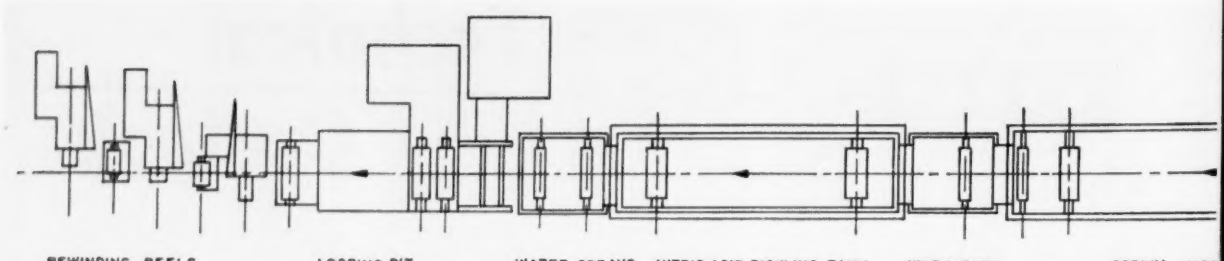
SILENT THIEF—Check oxygen and acetylene hoses and their connections for leaks at least once a week with greasefree soapy water, suggests Linde Air Products Co., New York. Leaks, always a safety hazard, can spell difference between job profit and loss.

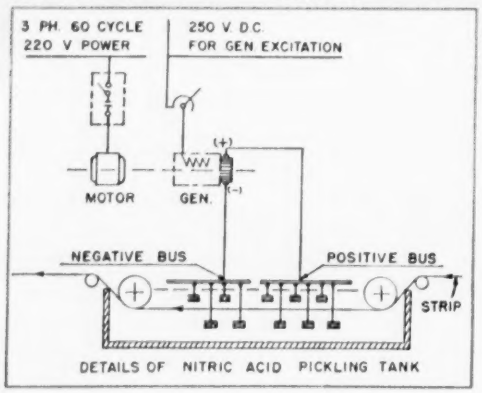
HOT STRIP SHOW—TV screen in control pulpit for 80-inch hot strip mill at U. S. Steel's Gary, Ind., plant affords operators a rare privilege: For the first time, they're able to see what's going on behind a battery of water sprays. Camera that transmits picture to 10-inch screen is mounted 48 feet above runout table.

OILING UP—Until improved engine designs and tailored lubricants materialize, it looks as if additive lubricating oils are the answer for high-speed diesels, General Motors reports. Dilemma: Though advanced refining techniques remove unwanted impurities, they also remove desirable constituents. A consolation is that the higher first cost of additive oils is cancelled out in the long run by extending oil life, minimizing wear.

WHAT'S ON THE INSIDE—Triple strands of stainless steel strip get triple treatment (annealing, descaling, electropickling) in one pass, p.96. For different slants on coating, turn to the second installment of "Use the Right Process for Coating Steel with Aluminum" on p.138 or how phosphate coatings added hours to die worktime on p.102. Other highlights include high-speed production of nonferrous tubing on p.146; trick of getting carbon on the steelmaking team on p. 105.

Metalworking Outlook—p. 45 *Market Outlook—p. 153*





Stainless Strip

DESCALED AND BRIGHTENED

Three strands of stainless steel strip are annealed, descaled and electropickled in a single pass through the line. Scale-free surface shows no base metal attack

USE OF sodium hydride descaling followed by an electrolytic nitric acid pickle gives good surface qualities in stainless steel strip. The unetched finish is ideally suited for buffing to a high lustre.

Sharon Steel Corp. operates the Du Pont sodium hydride descaling process in a continuous annealing, descaling, electrolytic pickling operation on stainless strip of all 300 and 400 grades. Treatment of steel in continuous strands in a line such as Sharon's (see diagram) shows advantages of minimum processing costs and uniformity of product. Normally the unit is used for processing cold reduced material of intermediate and finished gages. However, hot rolled stock of both nickel-chromium and straight chromium grades are descaled and pickled successfully.

Single Pass — The steel is annealed, descaled and electropickled in a single pass through the line under controlled conditions that are easy to duplicate. Emerging from the hydraulic water scrubber, which follows the electropickle, the clean bright strip is inspected and coiled with interweaving layers of paper to prevent abrasion.

The electrolytic nitric acid pickle step used at Sharon replaces the sulphuric acid pickle, rinse, and nitric acid pickle generally used for brightening the descaled stainless.

Starts Here—Cold reduced stainless steel, too hard to permit further reduction, is received at the line in coils weighing up to 5000 pounds. The steel which may vary in gage from 0.010 to 0.120 inch and in widths up to 18 inches is placed in position on the uncoilers to be delivered continuously to the line. As the end of one coil is reached, the lead end of a second coil is bolted to the tail end of the first coil to be drawn through the line. Generally, three separate strands of steel are run in parallel.

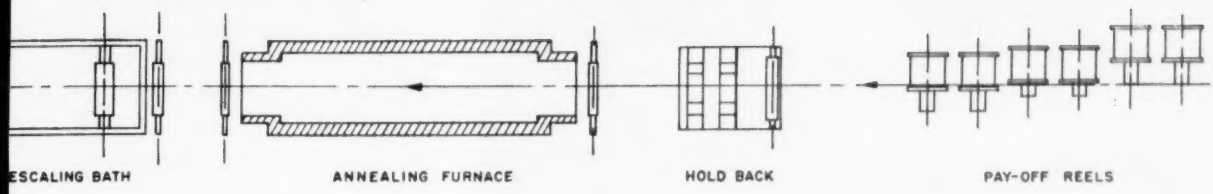
After being payed-off from the uncoilers, the three separate strands pass through an edge guiding device to maintain individual strip alignment and into the back tension stand. At this point, considerable pressure is applied against the strip surface by air-operated, hydraulic pressure blocks. Damage to the strip surface is prevented by short lengths of carpeting on either side. Drag pressure is thus applied to the strip in an amount sufficient to support the weight of the steel suspended in a catenary through the 35 to 40-foot length of the annealing furnace. The steel is supported by rolls only at ends of the furnace.

Anneal Here—The gas fired annealing furnace, next in line, is held at the required annealing temperature in range 1400 to 2000° F depending on the particular grade of steel being treated. The line speed is varied from 3 to 35 fpm with the gage so that the steel reaches the proper temperature just before it emerges from the furnace.

Leaving the annealing furnace, the steel is partially cooled by passing through air for a few feet before entering the sodium hydride bath. Another set of edge guides located in the cooling area facilitates tracking.

Scale Comes Off—Strip enters the sodium hydride descaling bath by passing under a hold down roll and is pulled through the bath horizontally to a second hold down roll located about 30 feet from the first. The steel spanning this distance is also supported by the drag exerted at the back tension stand.

The molten caustic bath is maintained at 700° F, and sodium hydride is produced in 8 generator boxes. These boxes are open at the bottom (see diagram) so that the bath partially fills them. The operator periodically adds 5 pound bricks of sodium to the generator boxes. Hydrogen comes from dis-



The sodium hydride descaled strip moves between electrodes, where it is alternately anodic and cathodic

CONTINUOUSLY

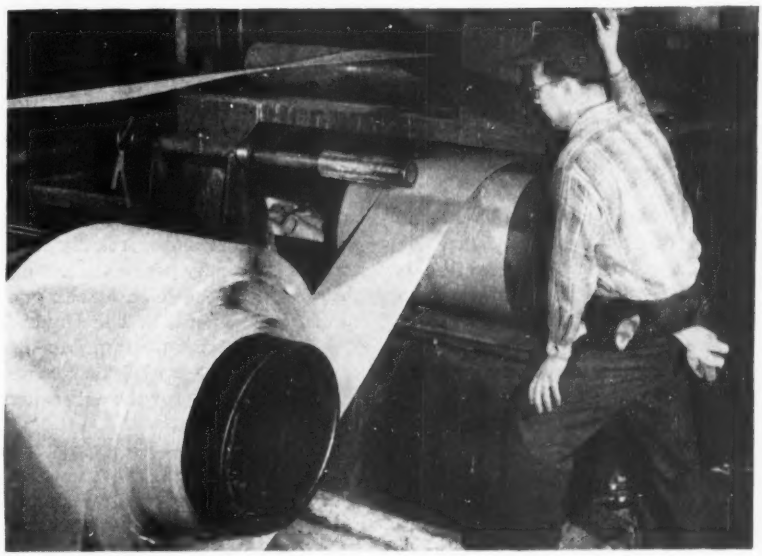
By LORENZ H. WILSON
Sharon Steel Corp.
Sharon, Pa.

sociated anhydrous ammonia which is fed into the generator boxes. Sodium and hydrogen react directly in the generator box to form sodium hydride as shown by the following equation: $2\,Na + H_2 \rightarrow 2NaH$

Sodium hydride formed dissolves in the molten caustic and diffuses uniformly into the bath from the bottom of the generator box. Since the hydride descaling bath does not give off irritating fumes or vapors, there is no need for hooding. The concentration of sodium hydride is maintained in the range 1.5 to 2.0 per cent. This concentration is regulated by the sodium feed rate. Generally, one 5-pound sodium brick is added to each of the eight generator boxes every hour. A simple gas evolution method can also be used to test the concentration of sodium hydride in the bath.

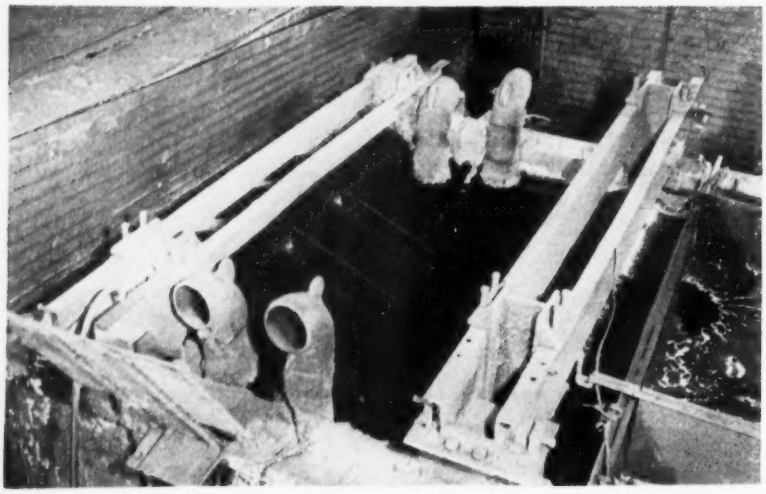
Chemistry Takes Over—Descaling is based on the chemical action which takes place between oxide scale on the surface of the strip and the sodium hydride dissolved in the bath. This descaling action is directly opposite to scale formation by oxidation. The scale is chemically reduced to metal or lower oxides, the major portion of which is flaked off during the rinse step which follows.

Here's one real advantage of the



Surface of treated strip is free from scale, smut, pitting and intergranular attack. It is coiled with interleaving sheets of paper to prevent abrasion

Periodic addition of sodium metal maintains sodium hydride concentration of about 2 per cent in descaling bath. Sodium reacts with hydrogen from dissociated ammonia in generators at side of bath. Hydride attacks scale, not metal



Strip leaves hydride descaling bath and enters water quench which removes most of the reduced scale. Water spray follows to dislodge residual material

sodium hydride method: There's no danger of over-treatment since the reaction ceases when reduction is complete. One of the common troubles of pickling methods is overpickling of exposed surfaces while getting the scale off the less exposed ones. With hydride descaling, this does not occur. So long as the metal remains in the bath for sufficient time to reduce the scale, it can remain there as much longer as desired without change.

Pitting troubles such as might be encountered in scale removal with acid pickling are nonexistent at Sharon. Pitting can be due to several causes. There is the tendency of acid to attack some small areas of bare steel more readily than others. Acid may penetrate through breaks in the scale to attack good underlying metal. The hydride process does no pitting. It also does not set up any of the common causes of pitting for the subsequent acid treatment.

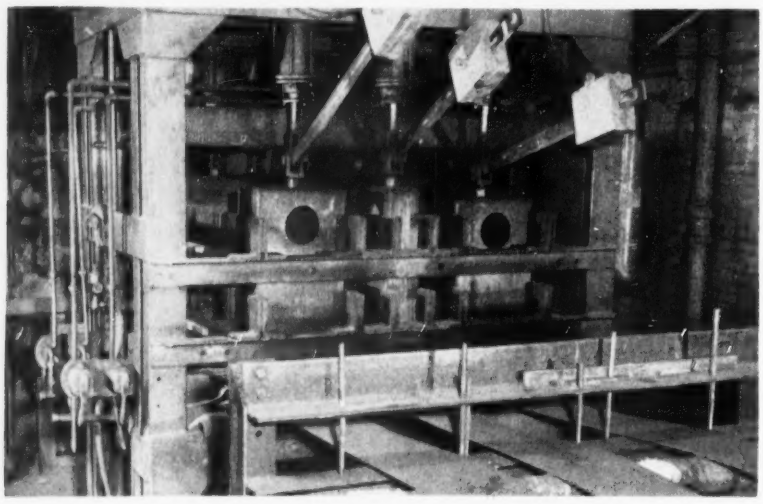
Dislodge Scale—Emerging from the descaling bath, the strip travels under a roll partially immersed in water in the quench tank. Quenching is an essential part of the descaling operation, since the steam generated by the 700° F strip entering the water is sufficient to dislodge and remove the major portion of the loosely adherent reduced metal as well as the caustic soda on the strip surface. Any material not removed on quenching is dislodged by sprays which operate at 175 psi water pressure.

At this point in the cycle, the steel surface is free of scale but may have a light smut and may be dark or stained in appearance. Further treatment is needed to obtain a uniform, white unetched surface.

Electropickle—To finish off the strip, Sharon uses an electrolytic pickle in 3 to 6 per cent nitric acid which was developed in their laboratories. This pickle solution is maintained at room temperature. The strip moves between suitable electrodes, where direct current of 500 to 1000 amperes at 12 to 20 volts is passed between the electrodes and the strip. The strip is cathodic in one area of the tank and anodic in another. The action of the electrolytic pickle loosens smut, removes stains, and does not harm the high quality pitfree surface.

A hydraulic scrubber using water at about 375 psi pressure removes smut loosened in the electropickle. This is followed by a hot air dryer.

The bridle stand, which is next in line, provides all of the power to pull the strip through the line. A looping pit is located after the bridle stand to provide time for shearing out the bolted joints and to allow for removal of full coils from the three coilers. Primary product inspection is also made at the coilers where both upper and lower strip surfaces can be seen.



Three strands of stainless strip leave the uncoilers and pass through a back tension stand which forms the strip into a catenary as it passes through a 40-foot annealing furnace. Strip leaves the furnace and enters hydride bath

Replacement for Hydrofluoric

A new powdered product called Actane 33 which, in many cases, will replace hydrofluoric acid is announced by Enthone Inc., New Haven, Conn. Because of the powdered nature of the product, there are much less hazards in handling it than liquid hydrofluoric acid.

The substitute can be used in combination with sulphuric acid to remove silca, sand and scale from steel. It can be used with nitric acid and ferric sulfate for pickling of stainless steel, or with sulphuric acid for etching aluminum.

Brazing Tips for Flexible Hose

Tests reveal that silver alloy braze works well on all flexible metal hose applications. Proper fluxing, heat control and braze speed are things you should watch for

By JAMES R. SUMMER
Project Engineer
Titeflex Inc.
Newark, N. J.

YOU'LL NEED the right bond between flexible metal hose and couplings if you want maximum joint strength and service life. It's another case where proper installation assures simpler maintenance.

Engineers of Titeflex Inc., Newark, N. J., have completed some laboratory tests to determine the most economical methods for attaching the couplings.

Silver Proves Itself—Results of the tests indicate that for all metal-hose applications, silver alloy brazing provides the most satisfactory bond between coupling and hose. This includes those installations where high pressure and medium-high temperatures are significant factors.

Here are some reasons for the effectiveness of silver brazing in this application. First, rapid flow of metal, inherent in silver alloy brazing, provides a greater area of bond across the surfaces being joined. This results in an especially strong seal.

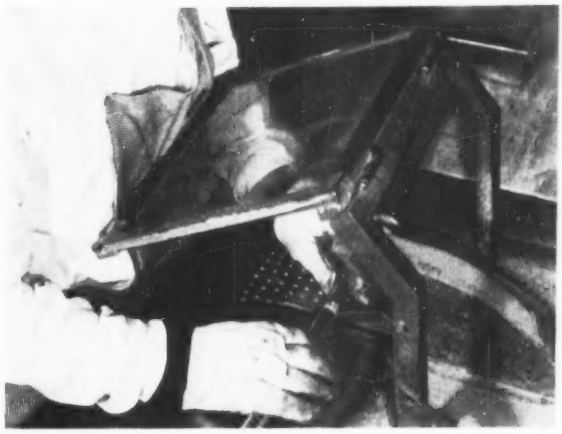
Just Warm—Second, silver alloy brazing doesn't require temperatures sufficiently high to cause excessive annealing of braid, tube or fitting. It is important to remember that the fine wires which make up metallic hose braid are significantly affected by extremes of heat and the extent of this effect during joining depends on the product of maximum temperature and the time required for the joining process.

Third, properly-formed silver alloy brazed joints are dependable through a major part of the temperature range in which the metal of the hose itself has effective service life.

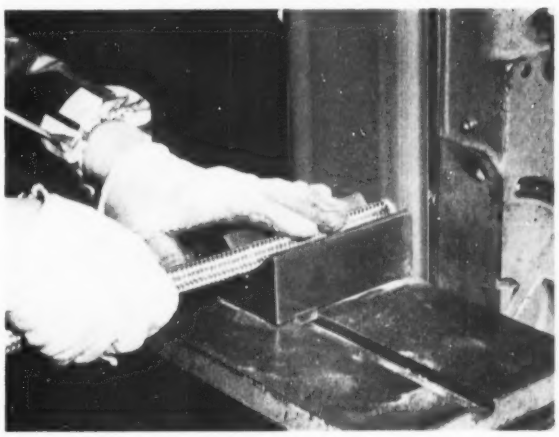
The Make-Ready—Proper preparation of both hose and fittings is essential for achieving maximum joint strength, bonding depth, and pressure and temperature durability throughout service life. Where flexible metal hose is purchased already coupled from the manufacturer, brazed joints need merely be sampled for adherence to service performance specifications.

However, in the numerous applications where flexible metal hose lines are coupled on the job, several important precautions should be observed. Hose braid should be spot-soldered to the convoluted inner tubing or securely clamped at point of cut to prevent unravelling during cutting. Flexible metal hose can then be cut to length, being held securely in a square-end sawing vise or between pipe collars at the exact point where hose is to be cut.

Seat Check—After cutting, loose braid ravellings



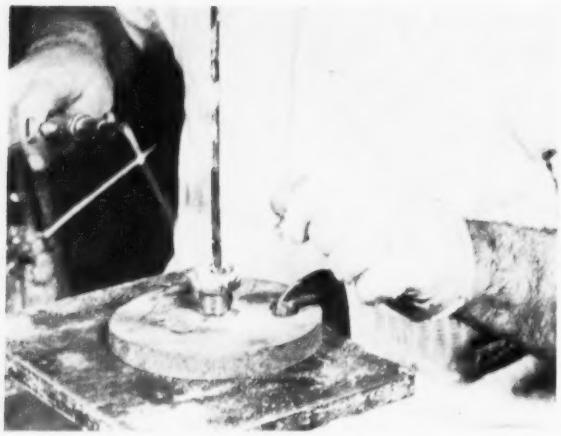
Wheel cuts hose to length and . . .



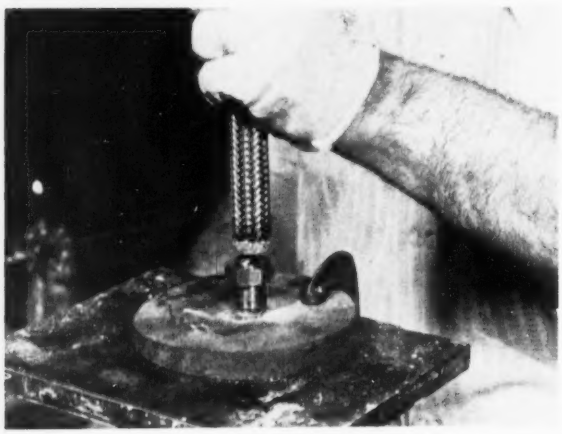
end of hose is squared. Next . . .

the flux is put on fitting and . . .

BRAZING TIPS . . .



silver braze is laid in. Then . . .



hose is put in place. A tip for . . .

high production—use induction heating

should be removed with metal shears. Tube end must then be deburred with a short-bitted pipe reamer or similar deburring tool.

Before cleaning, the hose end should be tested in the coupling sleeve for flush seating of the hose end and fitting seat. Properly-made silver brazed joints should remain intact throughout service life at maximum pressures which the hose itself is designed to withstand.

As a Hound's Tooth—Proper joining requires an absolutely clean surface on both the hose braid and coupling sleeve. Clean both the inside and outside of the coupling sleeve. Both should be cleaned with a wire brush to remove rust and oxides.

All surfaces to be joined should be cleaned in carbon tetrachloride or other solvent to free them from grease, oils and dust particles. Surfaces should be fluxed immediately after cleaning and should not be handled thereafter.

Must Spread—Since braze joining of tubular parts doesn't allow clamping before heating, there is nothing to break down surface tension of the molten alloy and cause it to flow except gravity and capillary action. Therefore, joint surfaces must be completely fluxed so the molten alloy will wet them and spread evenly.

Flux must be fluid and chemically active at the melting point of the brazing alloy. Avoid leaving excess flux inside hose or fitting.

A Deceiver—Unless care is taken in preparing, fitting and thoroughly fluxing the joint, parts of the bonding surfaces may be unwetted, causing the brazing alloy to flow in irregular channels. This uneven flowing may tend to form fillets at the both ends, giving the appearance of a good joint when only a small portion of the surfaces are actually bonded.

For on-the-job brazing of metal hose to couplings, a low velocity bulbous oxyacetylene tip or multiflame tips are recommended. Because of the high temperature of the flame and the relatively low flow point of silver brazing alloy, joining should be accomplished before measureable annealing takes place on the hose braid. Torch should be adjusted for a slightly reducing flame.

Short Heat—Coupling must be held securely and tinned with sufficient cold solder to form a complete bond around the joint sleeve. Heat is applied uniformly to coupling until the brazing alloy flows. Hose end is then inserted until it is firmly seated, and is gently rotated to avoid formation of solder fillets and to reduce possibility of flux inclusion.

Heat must be removed immediately and care taken to insure that the torch flame never comes into direct contact with hose braid. Care should also be taken to avoid overheating the joint.

Take off Flux—As soon as the heat has been removed and the joint cooled, the latter can be washed with a wet brush or swab and hot water to crack and remove excess flux. All flux must be removed from the joint before installing or pressure testing the coupled unit.

For joining flexible metal hose to couplings on a production basis, Titeflex tests indicate the advisability of using induction brazing.

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PROOF

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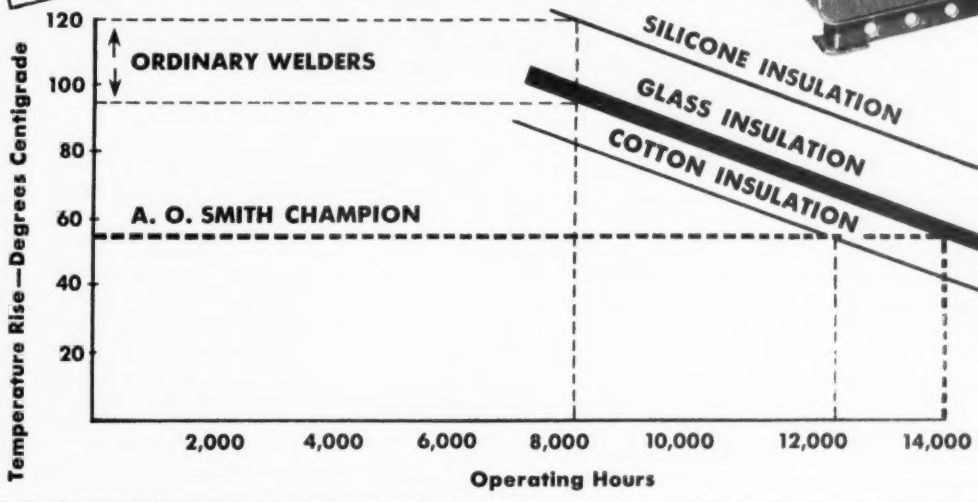

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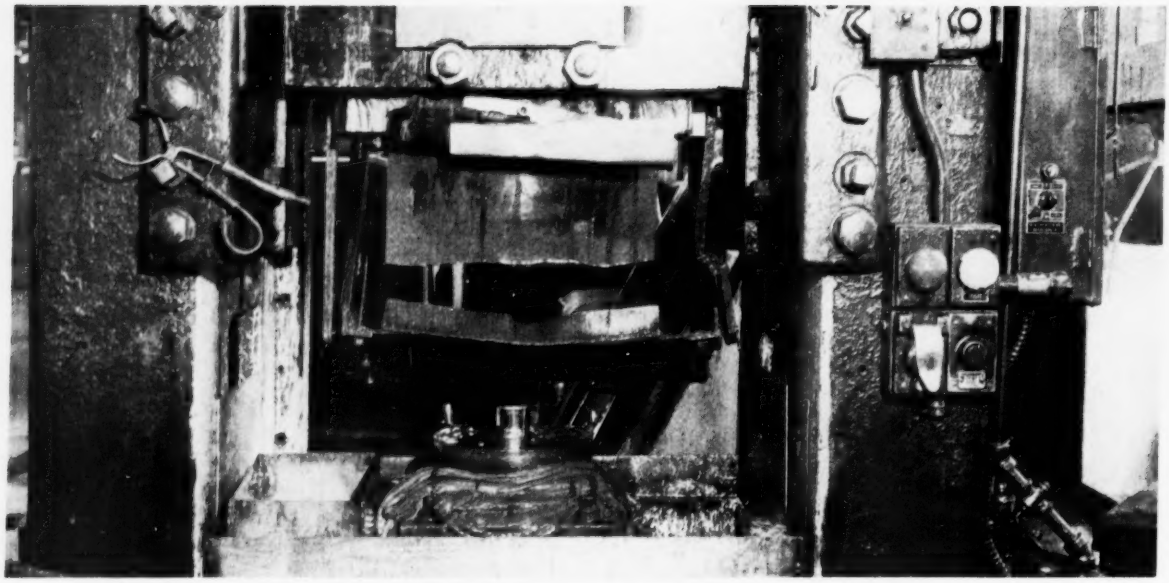

Die and a portion of the 800-ton press in which it is used to convert short lengths of steel tubing into flanged fluid coupling housings in a single blow

Coating Halts High Coining Costs

Die for flanging seamless tubing on 800-ton press, formerly changed after six hours use, works 15 eight-hour shifts when blanks get phosphate coating

DECISION to give each blank a phosphate treatment before going through a coining press at Chrysler Corp. is keeping the press in operation about 20 times longer than was previously possible.

Parts are seal housings for fluid couplings. They have been for many years and continue to be fabricated from MS 345 (equivalent to SAE 1020) steel tubing, measuring 2-5/16 inches long with ID of $2\frac{3}{8}$ and OD $2\frac{7}{8}$ inches.

Coining Operation—In practice, each length is placed over a pin in the lower half of a die in an 800-ton Bliss No. 78 press and struck by the upper die. In this one blow, struck cold, the upper end of the tube is coined to form an outturned flange 3-5/32 inches in diameter and 9/32-inch thick.

Dies subjected to these heavy blows, though made of the best steel available, had to be removed for servicing after each six hours of use and the press was down for repairs about twice a month. These operations were costly themselves, and of course, involved production delays.

Try Coating—To reduce these losses, it was decided to give each blank a phosphate (Bonderite) treatment, as the resulting coating is known to reduce die wear. Results have been so good that dies now remain in the press a full week, being used three shifts or substantially 24 hours per day. This is about 20 times longer than before and involves no downtime for die changing during the week. Die repair costs are correspondingly lower, press repairs reduced.

After phosphate coating, each length of tubing is dipped in Nosep lubricant before it is placed in the die illustrated above. As the phosphate coating is porous, it helps to absorb the lubricant and to keep it where it is wanted while the part is in the die.

Another Dip—Coined parts coming from the die require internal threading and this thread, of course, cuts through the very thin phosphate coating. When the housing was screwed in place in assembling the fluid drive, or in subsequent use, galling of the thread occurred and made it difficult to remove the housing if this became necessary. To avoid this galling, the housing is now given a second phosphate coating after the thread has been cut. The treatment has been effective, and no further trouble from galling has been experienced.

Thus, although phosphating is done twice and for two different purposes, it accomplishes desired results. This may be partly because lubricant is held where needed by the phosphate film, but it is believed that the film itself provides something of a lubricating nature. In any event, results are beneficial and are attained at almost insignificant cost, as parts are phosphated in bulk lots by simple dipping treatment whose cost per piece is negligible.

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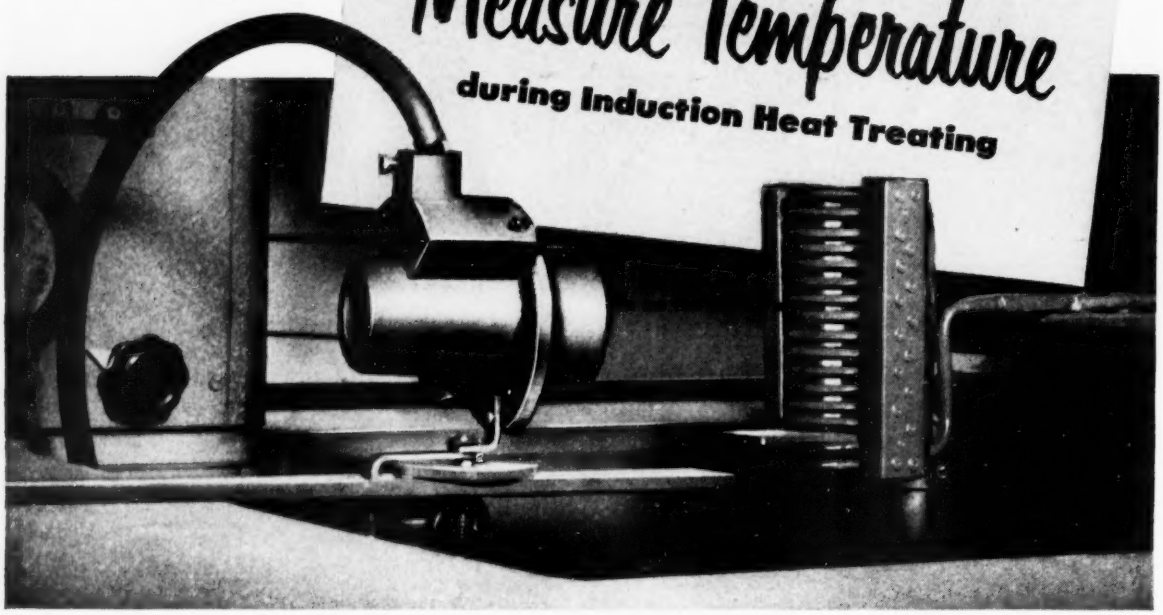

In this simplified set-up the Rayotube detector is sighting on steel bar stock between coils of the heating unit. A Speedomax controller connected to the Rayotube automatically regulates and records temperature.

This installation is at Lehigh University where the Dept. of Metallurgy uses a Lepel High Frequency Induction Furnace to investigate the influence of induction heating on the properties of various steels.

With this new Rayotube detector, it is possible for the first time to measure and control temperature of metal parts being heat treated by high frequency induction during their entire cycle.

Mounted only four inches from the induction heating coil, this newest member of the Rayotube family can focus on an opening as small as 0.1 inch between turns of the coil, and through this opening sight on the hot surface of the work. The Rayotube is so fast it reaches 99% of true temperature in 0.6 second . . . is always within 0.15 second of changes in work temperature.

Teamed with a Speedomax instrument it enables you to automatically measure, record and—if desired—control the entire heating cycle directly from the temperature of the work.

If you'd like more details about using Rayotube detectors on high frequency induction heating or similar applications, just write us at 4957 Stenton Avenue, Philadelphia 44, Pa.

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Catalog Number	8891-C
Response Time	0.15 second to 63% of temperature change; 0.6 second to 99% of temperature change.
Minimum Target Size	0.1 inch at 4 inch focus
Range	1100 F up
Housing Temperature	Can safely withstand 350 F maximum ambient temperature
Optical System	Narrow-angle, double mirror type with visual viewer
Case	Metal, hermetically sealed, including covered leadwire terminal block

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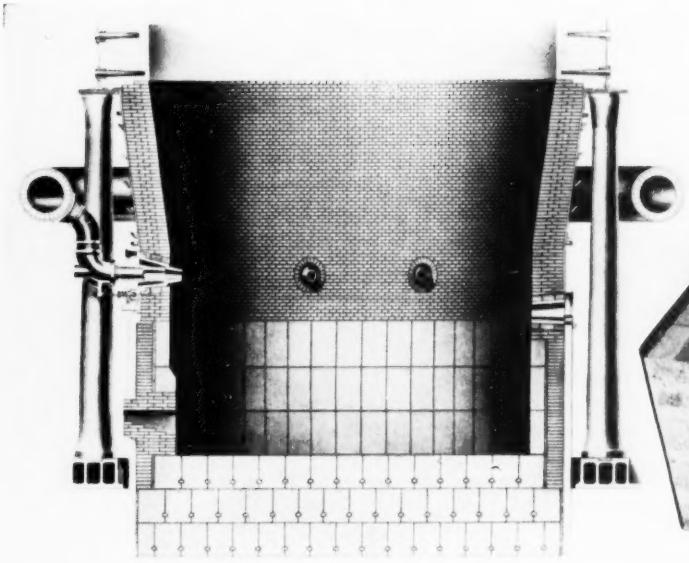
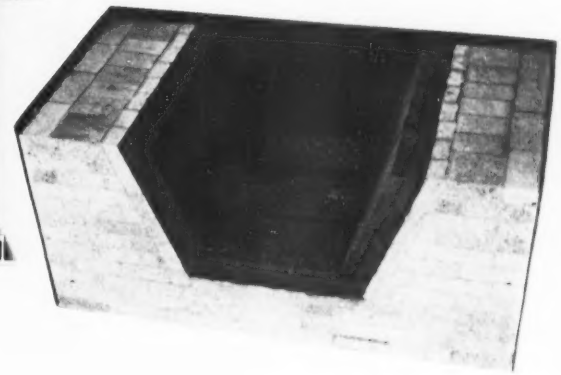


Diagram of blast furnace shows carbon-lined crucible, tuyere and bosh areas. Some bottom beams are 15 feet long, weigh over 3½ tons

Service life of carbon-lined runout troughs is often as long as furnace lining. Oxidation is reduced by clay slurry coating after casts



More Carbon For The Steelmaker

But not the kind that troubles him in his furnace heats. These are some of the manufactured carbon products that help get more tonnage out of his production dollar

By J. S. COPLEY and E. F. SIPP Jr.
National Carbon Co.
division of Union Carbide & Carbon Corp.
Pittsburgh

EVERY ENGINEER in the steel industry is familiar with the element carbon and the importance it holds as an ingredient in the many types of steel. However, the unsung role of carbon as an article manufactured into tools and equipment for handling steel in its various stages of processing and finishing is pretty much taken for granted.

Fabricated carbon products have made possible modern alloy steels, nonferrous alloys, numerous metallurgical and electrochemical products, abrasives and low-cost aluminum. In short, they are basic to our present industrialized world.

Lowly Carbon Brush — From mining of raw materials through all the materials handling, and right into the steel mill, the carbon brush is the vital cog in horsepower. In its application we take advantage of carbon's high resistance to abrasion, good electrical conductivity, susceptibility to predetermined resistance and contact drop, along with nonwetting or nonfreezing to adjacent metal conductors.

Getting away from electrical applications and into metallurgical uses of carbon, we take advantage of four outstanding properties of carbon: Nonwetting, low coefficient of thermal expansion, mechanical stability at elevated temperatures and high abrasion resistance.

Look at Blast Furnaces—These qualities make carbon ideal for the blast furnace, where it is widely used for linings in the crucible, tuyere, and is presently being put into furnace bosh areas. Members range in weight from a few pounds for bricks to over 7000 pounds for the large hearth beams. Volumes range from 100 cu in. to over 120,000 cu in.

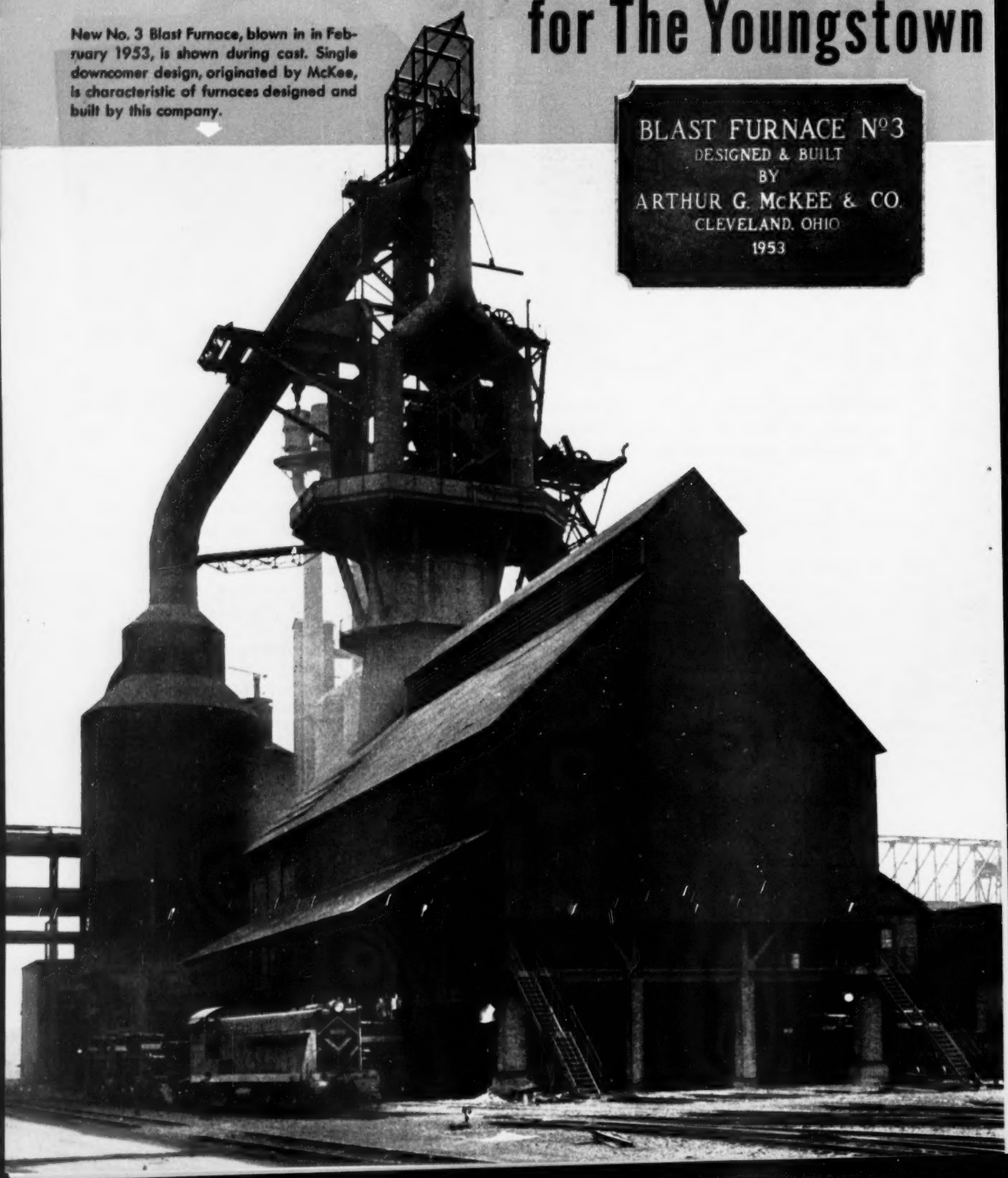
More than 90 American blast furnaces are operating today with carbon-lined crucibles. Several of these hearths have handled over 2½ million tons of iron and many more are still in service with over 2 million tons handled. Because carbon shapes have turned in such excellent records as blast furnace lining materials, their use is being extended to other parts of the furnace.

Nonwetting Properties—Carbon is widely used as a cinder notch lining, either in brick form or machined one-piece liners. It is further used in brick and plate form for lining runout troughs, skimmer blocks and similar applications. Nonwetting properties of the element are especially valuable because metal pulls away from the carbon as it chills, easing removal of the iron skull from the cinder notch and trough areas before the next tap.

Carbon mold plugs for closed-bottom ingot molds and graphite stool inserts in big-end down, open-bottom molds exhibit high accuracy of contour, do not spall to contaminate the ingot, will not stick to the ingot, may be used several times in many cases; they are light, mechanically strong,

McKee completes *another* for The Youngstown

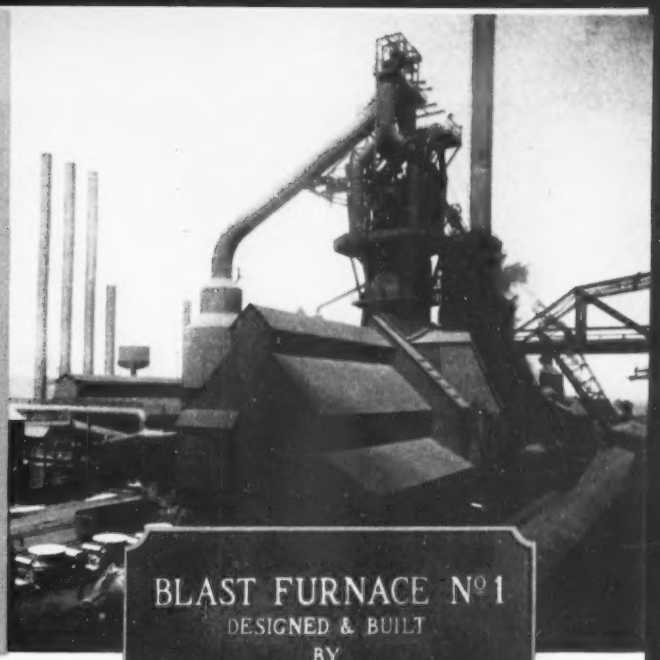
New No. 3 Blast Furnace, blown in in February 1953, is shown during cast. Single downcomer design, originated by McKee, is characteristic of furnaces designed and built by this company.



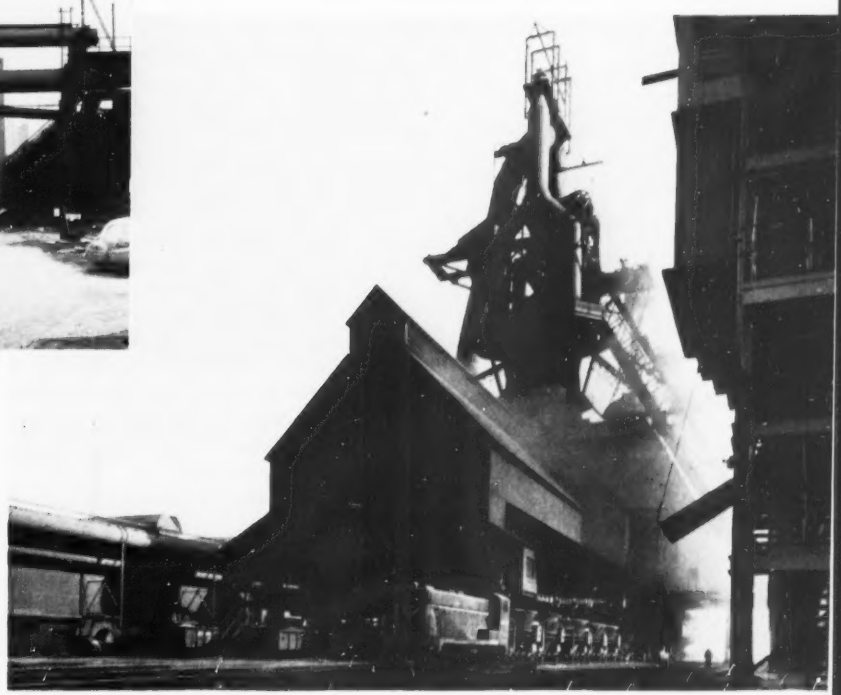
Blast Furnace

Sheet & Tube Co.

AT INDIANA HARBOR, IND.



The photograph of No. 3 reproduced above shows new gas mains in the foreground with service elevator and gas bleeding stack on the left.



Photograph of No. 3 furnace at right shows the skip bridge, top structure and cast house with slag ladle and service tracks.

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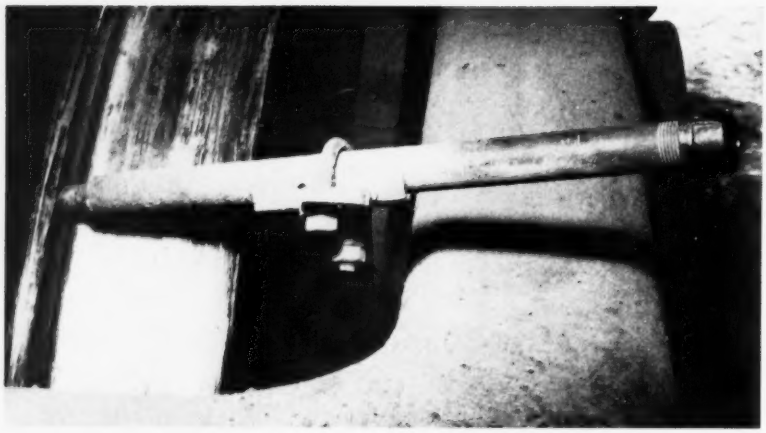
British representatives of Metals Division: Head, Wrightson & Company, Ltd.
Canada: **Arthur G. McKee & Company of Canada, Ltd., 350 Bay St., Toronto 1, Ont.**



An unusual application of graphite is this locomotive wheel flange lubricator. Spring pressure holds the graphite rod against the flange until the former is worn down. Replacement of the worn rod is a simple matter

easy to handle and resist abrasion.

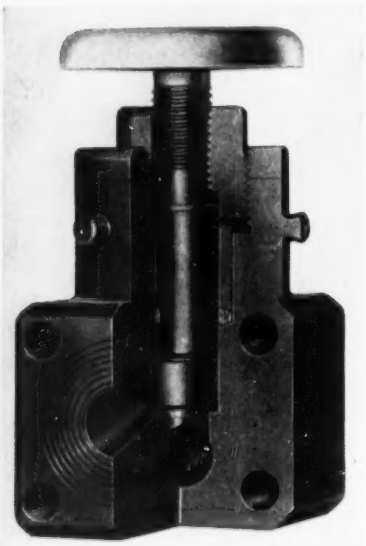
Graphite as an immersion thermal couple accessory is not too well known in this country but is rapidly proving its worth in this application. Life of the wire and metal parts is prolonged, readings are more accurate and maintenance is relatively simple and inexpensive.

Thermic Applications—About 7 per cent of the total steel ingot production of this country comes from electric arc furnaces using carbon or graphite electrodes. For steelmaking furnaces they range in size from 8 to 17 inches in diameter and from 60 to 72 inches long. Carbon electrodes for phosphorus and ferro-alloy furnaces today reach maximum size of 45 inches in diameter by 110 inches long.

Graphite electrodes in service on electric arc steelmaking furnaces range from 1½ to 24 inches in diameter and vary from 24 to 84 inches long. These and the carbon electrodes are firmly established in the field of electric steelmaking. They do not melt at any known temperature, but sublime at the temperature of the arc—6870 F—highest temperature yet attained by artificial means. Carbon and graphite are the only known materials possessing the most advantageous combination of physical, chemical and electrical properties to meet requirements of arc furnace use.

Graphite crucibles for induction melting of specialized metals are also finding application in the steel industry, such as in titanium melting.

Mechanical Applications — Carbon-graphite bearings, because of their self lubricating characteristics, have been applied in steel mills to a number of applications where temperature or location does not permit lubrication. Typical applications include submerged bearings for acid baths, submerged bearings for hold-down rolls in hot dip galvanizing and hot work conveyor rolls.



This globe valve is made of resin-impregnated carbon and graphite, called Karbate. The material will withstand pressures and at the same time exhibit a desirable chemical inertness

Unique application of graphite is found in switcher locomotive wheel flange lubrication (STEEL, May 11, p. 115). Graphite rods are utilized to reduce flange wear on such locomotives used in steel mills. These are specially-cored rods manufactured specifically to do a positive job in reducing maintenance and increasing locomotive availability. Mounted in an easy-to-fabricate holder, worn rods can be replaced when necessary.

Chemical Applications — Handling of the corrosive liquids and gases required in the cleaning and finishing of steel has brought many carbon products into being in the last 10 years. Carbon's chemical inertness and other resistant qualities are the reasons for increasing use.

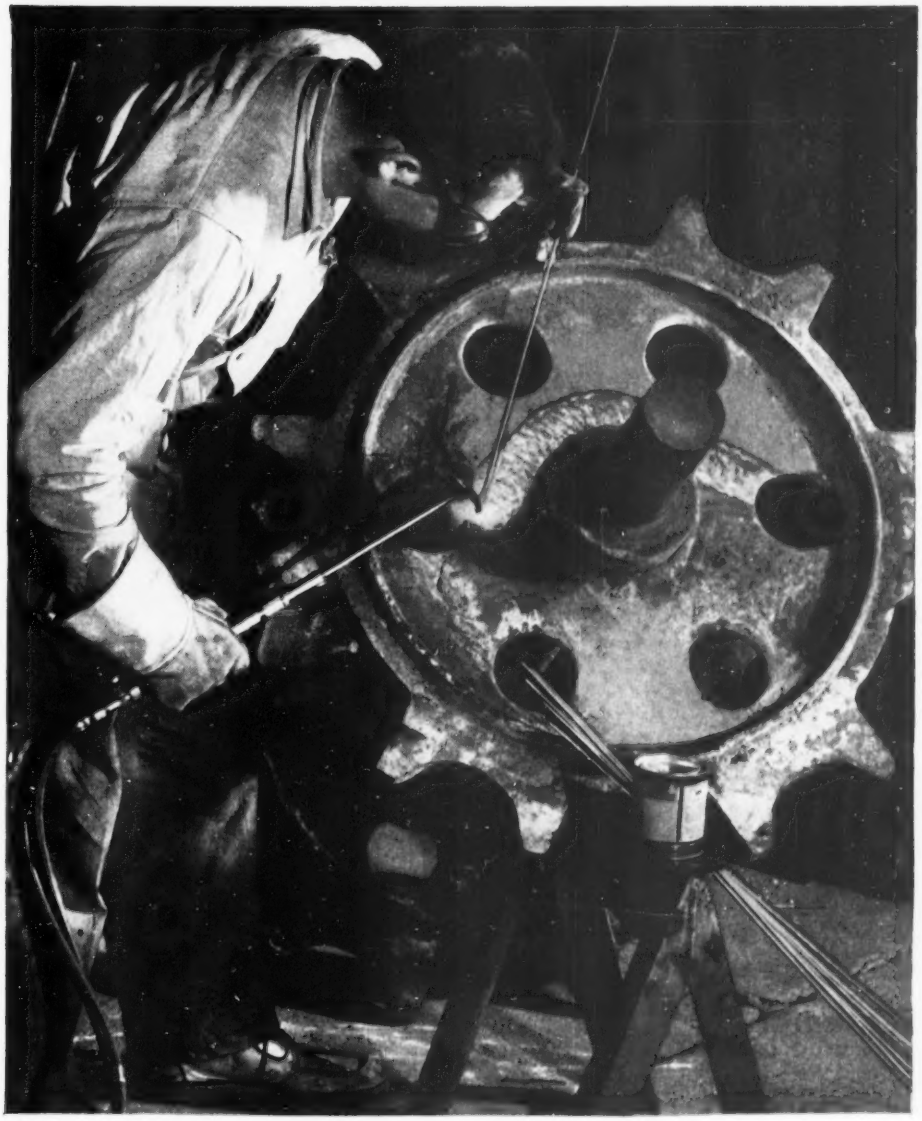
An impervious form of carbon and graphite, marketed under the trade name Karbate, is fabricated into such forms as pumps, valves, heat exchangers, steam jets, collector rolls, bearings, pipes and fittings, etc. Karbate is made by impregnating carbon and graphite with chemically-resistant synthetic resins to make them impervious to seepage of fluids under pressure. It retains its high thermal shock resistance while showing excellent heat conductivity.

Tank Linings—Carbon brick has proved to be an outstanding material for pickling tank linings in that it lends itself to such a wide variety of chemical conditions and types of acid solutions. It demonstrates uniform service life in hydrochloric, sulphuric and hydrofluoric-nitric solutions.

Another important use of carbon is found in the analytical side of steel production. The all-important arc source for the spectrograph is either the carbon or graphite electrode. Carbon burns with a steadier arc, especially at low currents, while the graphite electrode is more easily machined.

Each lot of special carbon and graphite spectroscopic electrodes is tested for impurities by a sensitive method that gives estimate of relative intensities of the most sensitive lines in the material. Those exceeding minimum limits are rejected.

From a paper presented before Cleveland and Youngstown Sections, AISE.



CONVEYOR DRIVE SPROCKET that was repaired by braze welding with ANACONDA-997 (Low Fuming) Bronze Rods in only 7 hours. Braze welds made with these rods are clean and strong . . . require little finishing.

SAVED: one expensive drive sprocket *plus* 53 operating days

Replacement of this fractured conveyor drive sprocket would have meant a two-month wait for delivery . . . and considerable expense to its smelting-plant owners. An inexpensive braze-weld repair had it back in operation in a matter of days. Job time was only 7 hours—4 in preparation, 3 in welding. Twenty pounds of 3/16" and 1/4" ANACONDA-997 (Low Fuming) Bronze Welding Rod were used.

Owner Walter Shanowsky, Universal Welding Co., Rochester, N. Y., reports that ANACONDA-997 (Low-Fuming) Bronze Rod gave a fast, sound weld. These rods 'tin' readily, flow freely and have good tensile strength. They melt at relatively low temperatures . . . work requires less preheating, so danger of warping or cracking is minimized.

Universal buys all its ANACONDA Welding Rods from the Welding Supply Corp. in Rochester. ANACONDA Welding Rods for almost every type of repair and production job are available from distributors throughout the United States and Canada. For latest tips on welding, write for Publication B-13 to: *The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.* 53166

braze or weld with confidence...

ANACONDA®

welding rods

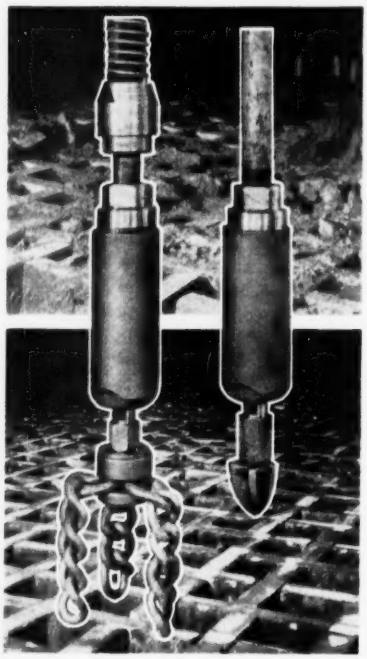
Unique Checker Cleaner

CLEANING square holes with a round tool is saving an eastern steel company two-thirds the cost of keeping open hearth checker flues unclogged. Laborers with hand scrapers used to put in some 170 manhours; now the job takes 60.

Making this possible is a special chain head developed by Lagonda Division of Elliott Co., Jeannette, Pa., for use with an ordinary air motor. Used with the air motor throttled down, the flailing action of these chains cleans out the caked ashes and soot without damage to the brickwork.

How It Works—When the checker is completely clogged, a drill head is utilized to first clean out the center portion of the mass. The chain head is then attached and, with motor speed checked, the rest of the congestion is removed. Even the corners can be effectively cleaned by the chain action.

Keeping an open hearth in production with as little downtime as possible is a fundamental proposition of the operation. A checker flue clogged with soot, tar and ashes will reduce furnace draft, lower combustion air volume and temperature and thereby increase heat time and furnace costs. When this happens, furnace must be shut down and the necessary cleaning done.



Before and after pictures of these checker flues show degree of effectiveness of the chain-flail cleaning

Savings in manpower are not nearly as important as the savings in downtime itself. With this cleaner, the open hearth can be back in production in a much shorter time thus increasing its over-all tonnage output, users report.

Something New . . Canned Spikes

An innovation in packaging track spikes, using all-steel containers, has been introduced by Inland Steel Co. M. S. George, manager of the company's railroad sales division, says Inland's new steel packaging method offers many economies to railroads at no extra cost over wooden kegs.

New steel container weighs nearly four pounds less than a wooden keg but holds the same 200 net pounds of spikes.

20 YEAR SUCCESS STORY

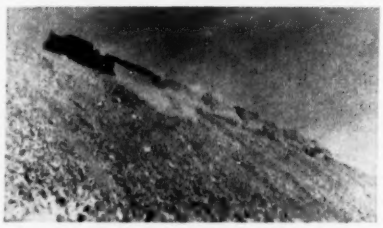
DIFFERENTIAL

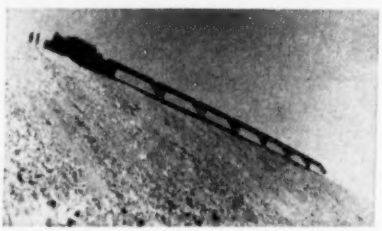
Air Dump Cars Serve the World's Richest Copper Mine

At this impressive ore deposit in Chuquicamata, Chile, Differential Air Dump Cars are used exclusively.

From an initial order for 20 cars (shipped in 1929) the Chuquicamata fleet of Differentials has grown to 120 cars. (And 60 additional cars are on order.) All dump cars purchased for this mine since the initial order in 1929 have been Differentials.

Today's Differential Air Dump Car shows some refinements but sticks to the original double-trunnion, double-fulcrum design which has earned a reputation for speedy, trouble-free and satisfactory performance through the years.





Action photographs taken at Chuquicamata

OTHER DIFFERENTIAL PRODUCTS:
Locomotives, Mine Cars, Mine Supply Cars, Rock Larries, Mantrip Cars, Rotary Dumpers Other Dumping Devices and Complete Haulage Systems

D
DIFFERENTIAL
STEEL CAR COMPANY
FINDLAY, OHIO

SINCE 1915—PIONEERS IN HAULAGE EQUIPMENT

Vanadium-Alloys

brand names*

that deliver

Distinctive Performance

on your **cold work** die jobs!

It pays to *buy by brand*——when the brand-name speaks for *extra performance on the job.* As makers of First Quality tool steels exclusively, we say: buy Vanadium-Alloys' steels by name—and get the values added to each composition by our *specialized process of manufacture* . . . values that are physical, measurable, and profit-making for you!

* **Non-Shrinkable Colonial No. 6** Non-Deforming, Oil Hardening Die Steel having excellent machining properties; low hardening temperature. Popularly used for blanking punches and dies, gauges, bushings, and miscellaneous tools.

* **Air Hard** 5% Chromium Steel with minimum distortion in air hardening. Especially adapted for better wear and toughness in thread rolling dies, form and blanking dies, punches, knurls, gauges.

* **Ohio Die** Air Hardening, High Carbon-High Chromium Steel. Free from movement in hardening, combines high wear resistance and toughness for difficult jobs. Your choice on trimming dies, shear blades, coining dies, rolls and mandrels.

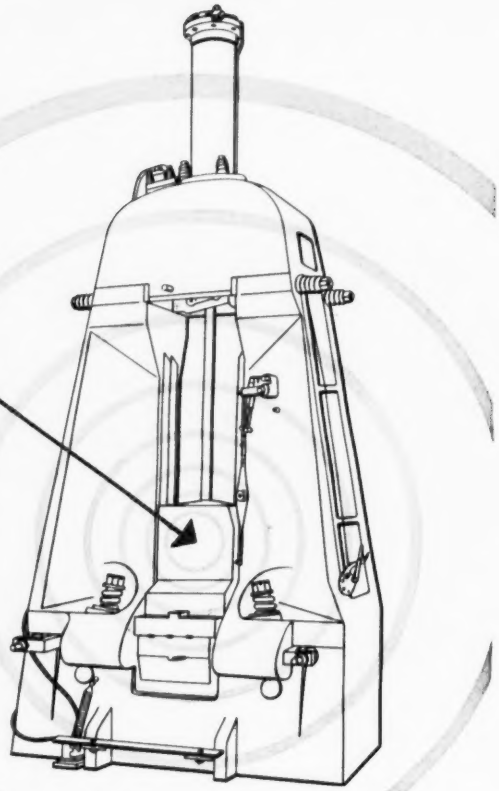
* **Crocar** High Carbon-High Chromium Die Steel with outstanding resistance to wear. Can be either air or oil hardened. Select this grade for lamination dies, wear plates, slitting cutters, and forming dies.

* **Red Star Tungsten** An unusual Oil Hardening Die Steel. Maintains keen cutting edges; excellent for punches, taps, blanking dies, spinning tools, and slitters.

Vanadium-Alloys
STEEL COMPANY
LATROBE, PENNA.

Colonial Steel Division — Anchor Drawn Steel Co.

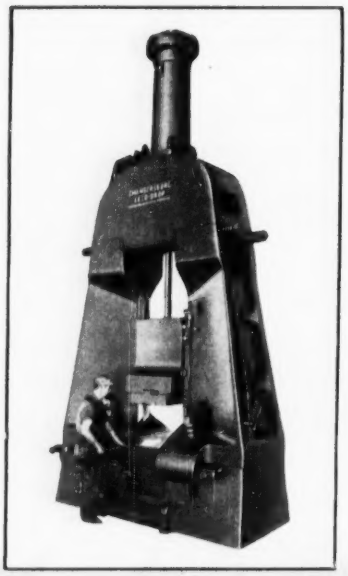
CENTER OF GRAVITY AT POINT OF IMPACT



• • • The center of gravity of the CECO-DROP concentrates the forces toward the base and gives a more effective blow.

• • • The center of gravity of the whole hammer approximates the center of gravity of the ram at the point of impact minimizing the fight between the ram and the other parts of the hammer.

• • • The resultant maintenance of die alignment assures fewer rejects and higher production in comparison with other types of forging hammer. This is an outstanding difference between CECO-DROPS and other hammers.



CECO-DROP PISTON LIFT GRAVITY DROP HAMMERS

are the result of more than a half century of experience in the design and manufacture of hammers. They cost less to operate. There are no board changes, no friction adjustments, and lubrication is automatic. Treadling the Ceco-Drop is easy and not fatiguing, and die alignment is held. The unique stroke adjustment and short stroke control afford a wide range of operation. Ask for our Bulletin 11-L-O.

CHAMBERSBURG ENGINEERING CO. • CHAMBERSBURG, PA.

CHAMBERSBURG

THE HAMMER BUILDERS

Builders of THE IMPACTER

"FORGING IN MID-AIR"

CALENDAR OF MEETINGS

August 17-19, Society of Automotive Engineers: International West Coast meeting, Georgia hotel, Vancouver, B. C. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

August 19-21, Institute of Radio Engineers: Western electronic trade show and convention, Civic auditorium, San Francisco. Business office: 1355 Market St., San Francisco 3. Business manager: Heckert Parker.

August 23-26, National Automatic Merchandising Association: Annual convention and exhibit, Hotel Conrad Hilton, Chicago. Association address: 7 S. Dearborn, Chicago. Secretary: C. S. Darling.

September 1-4, American Institute of Electrical Engineers: Pacific general meeting, Hotel Vancouver, Vancouver, B. C. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

September 2, Steel Kitchen Cabinet Manufacturers Association: Fall meeting, Hotel Cleveland, Cleveland. Association address: 1008 Engineers Bldg., Cleveland 14. Secretary: Arthur J. Tuscany Jr.

September 6-11, American Chemical Society: Fall meeting, Hotel Conrad Hilton, Chicago. Society address: 1155—16th St., NW, Washington 6. Assistant secretary: R. M. Warren.

September 9, Material Handling Institute: Fall meeting, Hotel Cleveland, Cleveland. Institute address: 813 Clark Bldg., Pittsburgh 22. Managing director: R. Kennedy Hanson.

September 9-11, Compressed Air & Gas Institute: Fall meeting, Fishers Island Country Club, Fishers Island, N. Y. Institute address: 122 E. 42nd St., New York 17. Secretary: Frank P. Anderson.

September 10-12, Rocky Mountain Management Club: Rocky Mountain industrial exposition, University of Denver arena. Club address: 1031 15th St., Denver 2. Executive secretary-treasurer: Harold S. Craig.

September 11-13, Metal Powder Association: Fall meeting, The Greenbrier, White Sulphur Springs, W. Va. Association address: 420 Lexington Ave., New York 17. Secretary: Robert L. Ziegfeld.

September 13-16, Electrochemical Society Inc.: Fall meeting, Ocean Terrace hotel, Wrightsville Beach, N. Carolina. Society address: 216 W. 102nd St., New York 25. Secretary: Dr. Henry B. Linford.

September 13-16, American Institute of Chemical Engineers: Fall meeting, Hotel Fairmont, San Francisco. Institute address: 120 E. 41st St., New York 17. Secretary: Stephen L. Tyler.

September 14-15, American Machine Tool Distributors Association: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Association address: 1900 Arch St., Philadelphia 3. Executive secretary: Thomas A. Fernley Jr.

September 14-15, American Hot Dip Galvanizers Association, Inc.: Semi-annual meeting, Statler hotel, Cleveland. Association address: 1506 First National Bank Bldg., Pittsburgh 22. Secretary-treasurer: Stuart J. Swensson.

September 14-16, Allied Railway Supply Association: Annual meeting, Hotel Sherman, Chicago. Association address: 1200 W. Chase Ave., Chicago 26. Secretary: Charles F. Weil.

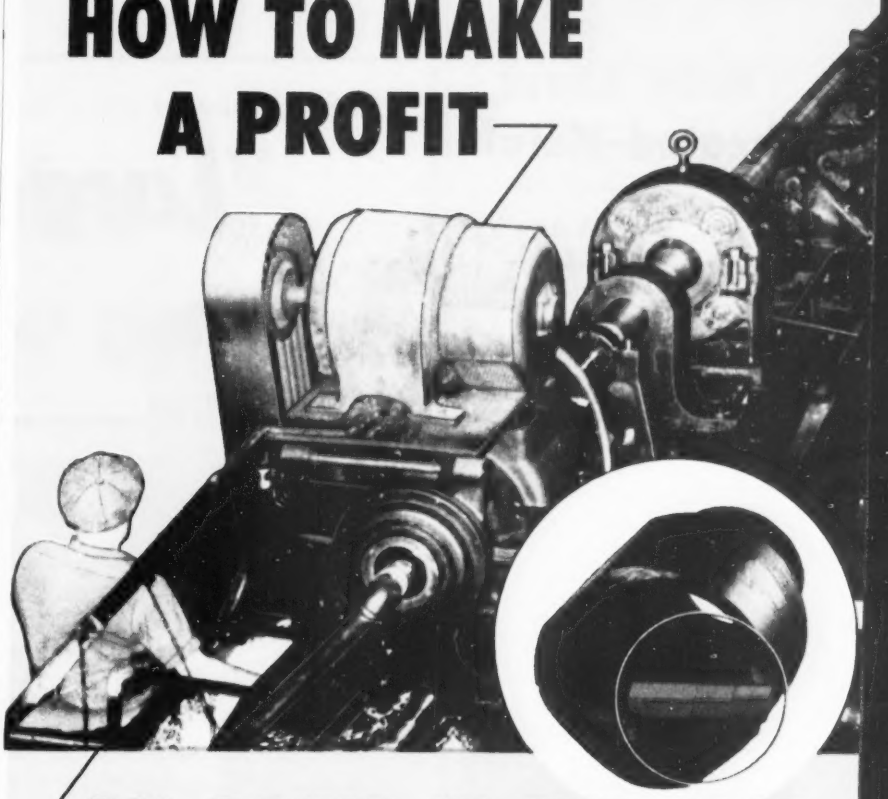
September 16-18, Porcelain Enamel Institute: Shop practice forum, Ohio State University, Columbus, O. Institute address: 1346 Connecticut Ave., NW, Washington 6. Secretary: John C. Oliver.

September 17-18, National Foundry Association: Annual meeting, Plaza hotel, New York. Association address: 53 W. Jackson Blvd., Chicago 4. Executive secretary: Charles T. Sheehan.

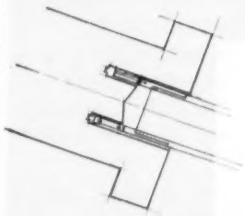
September 18-19, American Ceramic Society: Refractories Division meeting, Bedford Springs Hotel, Bedford, Pa. Society address: 2525 N. High St., Columbus 2, O. General secretary: Charles S. Pearce.

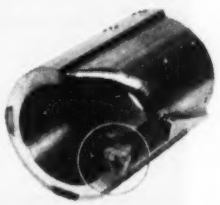
(Continued on p. 116)

HOW TO MAKE A PROFIT



BY GOING IN THE HOLE





Kennametal triple-edge tool trepans 4½″ diameter hole through 30′ workpiece at rate of 8 ft./hr. Three-inch core resulting from operation is usable for small diameter parts — a worthwhile saving in material.

Drilling or trepanning deep holes with Kennametal has saved hours of time — added dollars to operating profit. Here are two examples:

To drill a 30 ft., 3″ hole in chrome-nickel-moly steel with HSS spade drill required 12 hours. An off-center, triple-edge Kennametal drill head (shown above) did the job in 2 hours.

To trepan a 30 ft., 4½″ diameter hole in forged steel with HSS spade drill consumed 20 hours. A triple-edge Kennametal tool (shown at left) reduced the time to 8 hours.

Complete details of these two operations furnished on request. They are typical of a wide range of metal-working jobs on which Kennametal tooling has proved to be a profitable investment.
Kennametal Inc., Latrobe, Pa.

KENNAMETAL
CEMENTED CARBIDE TOOLING
THAT INCREASES PRODUCTIVITY

News About Created-Metals

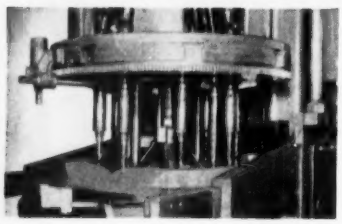
New "Brief-A-Log" Simplifies Ordering

A new condensed catalog and price list is being offered by the Carboloy Department of General Electric Company.

This "Brief-A-Log" (GT-265) incorporates Carboloy price reductions made June 22, and latest additions to the standard lines of tools and blanks.

Designed to simplify selecting and ordering, the Brief-A-Log is available free of charge. (Send coupon at right.)

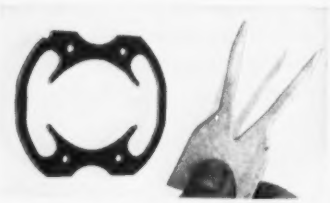
Drill Cast Iron with Carbide Twist Drills



Drilling cast iron with carbide twist drills is definitely past the "maybe" stage. Users report doubled production, more than tripled drill life over H.S.S. drills, without any special drilling equipment or job engineering. Sound, how-to-do-it technical bulletins available free. Write Carboloy Department of General Electric Company. (See address at right.)

New Applications for Carbide Press Dies

Carboloy carbide dies are being profitably applied to blanking and piercing operations where production runs are high.



These dies are economical to use because they produce burr-free, close-tolerance work . . . outlast steel dies by 8 to 10 times.

Write for free Carboloy Die Engineering Manual D-124. (See address at right.)

YOUR CARBOLOY FIELD ENGINEER SAYS . . .

"Large, costly special

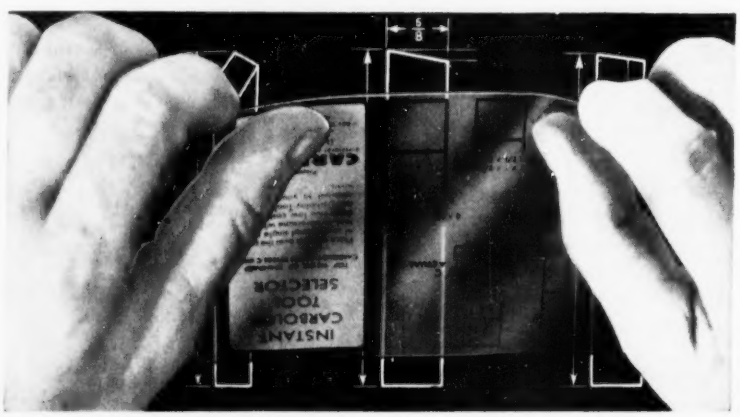
"Cut your special single-point tool stocks up to 30% with this simple-to-use MTI Plan

"The Minimum Tool Inventory Plan is based on the fact that the 11 Standard Carboloy Tools can be adapted to up to 80% of your special single-point jobs . . . thus eliminating many costly, made-to-print tools.

"The MTI Plan will show you which 'specials' can be eliminated, and exactly how much you'll save. With the 15% price reduction on Standard Carboloy Cemented Carbide Tools, in effect since June 22, now, more than ever before, it pays to standardize."

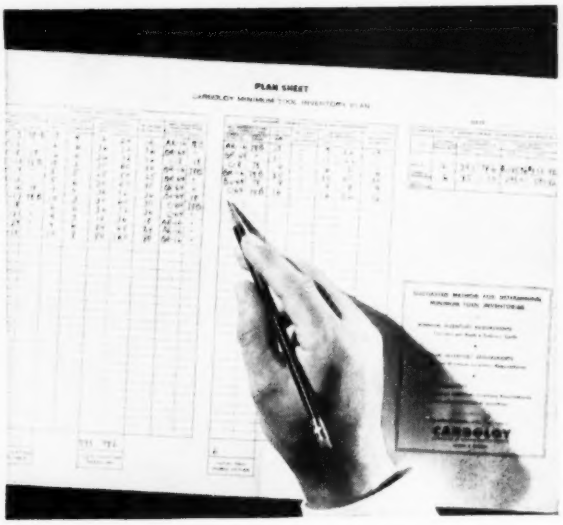
Send the coupon at right, attached to your company letterhead, for your free MTI Plan Kit. Then, determine your *own* benefits from the MTI Plan as follows:

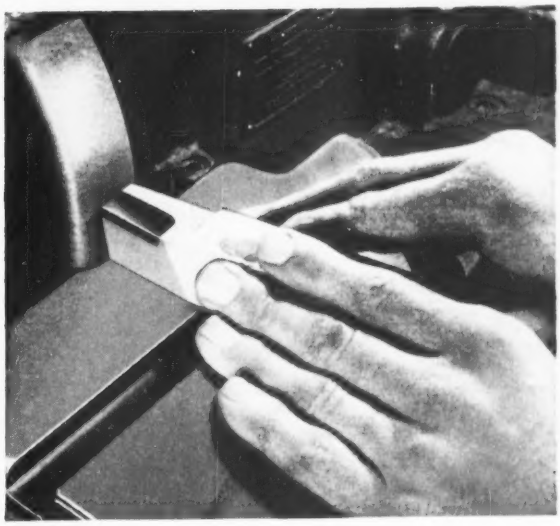
1. **Using the Instant Tool Selectors,** you'll see at a glance how only 11 Standard Carboloy Tools can be easily and quickly adapted to handle 4 out of 5 of your special, made-to-print tool jobs.



Advertisement

inventories of tools now unnecessary"





2. **With the handy Plan Sheet provided,** you'll quickly get a dollars-and-cents answer showing how much you'll save by standardizing. Simple subtraction shows you how much your inventories can be cut by using standards.

3. **Order the Standard Tools** you'll need from your local Authorized Carboloy Distributor. Use them "as is," or quickly grind them to your specifications. Grinding hints, price lists and Standard Tool specifications are included in Kit.

AUTHORIZED CARBOLOY® CEMENTED CARBIDES DISTRIBUTORS

CARBOLOY TOOLS ARE STOCKED COAST TO COAST

Look under "Tools" in the Yellow Pages of your local telephone book or in Thomas' Register for your nearby Carboloy Distributor. He has complete local stocks and services. Ask him about the MTI Plan.

"Carboloy" is the registered trademark for the products of the Carboloy Department of General Electric Company.

Send coupon—pinned to your company letterhead—for your free MTI Plan Kit

CARBOLOY

DEPARTMENT OF GENERAL ELECTRIC COMPANY

11141 E. 8 Mile Street, Detroit 32, Michigan

- ☐ Please rush me, at no cost or obligation, MTI Plan Kit
- ☐ Have your sales representative call to show me the Kit, without obligation
- ☐ Send me the new, free Brief-A-Log GT-265, containing complete specifications and prices of Standard Carboloy Tools and Blanks

Name _____ Position _____

Company _____

Address _____

City _____ Zone _____ State _____

SHIMS
ONLY
"SHIM HEADQUARTERS"
OFFERS YOU ALL 5 TYPES

THE LAMINUM® SHIM

SIMPLY PEELS FOR ADJUSTMENT

Made up of from 3 to 63 layers of .002 or .003 inch brass or steel, metallically bonded together over their entire surfaces. No dirt between layers. Peels with penknife.

THE LAMISOL® SHIM

FOR QUICK, ASSEMBLY LINE USE

The laminations of the LAMISOL® Shim (in brass only) are temporarily joined by spot-soldering on the edges. Gauges and number of laminations within one shim are unlimited.

THE LAMITAB® SHIM

FOR SUPER SPEED, THIN GAUGE SITUATIONS

The little tab holds shim laminations together firmly, yet is easily removed. Different metals can be used in the same shim.

THE LOOSE LEAF SHIM

FOR UNLIMITED FLEXIBILITY

This is the simplest of all custom-stamped shims. It is completely flexible. Usually sets including several different gauges are made up.

PACKAGED SHIM STOCK

READY FOR EASY USE, WITHOUT WASTE

Thin gauge 6" x 100" rolls feed through package slots. Heavier gauges in flat envelopes. Available from your Industrial Distributor.

*T.M. Applied For

SEND FOR LITERATURE

LAMINATED SHIM COMPANY, INC.

3408 UNION STREET GLENBROOK, CONN.

(Continued from p. 113)

September 20-23, Packaging Machinery Manufacturers Institute: Annual meeting, Skytop Lodge, Skytop, Pa. Institute address: 342 Madison Ave., New York 17. Secretary-treasurer: Helen L. Stratton.

September 20-23, American Institute of Wholesale Plumbing & Heating Supply Associations Inc.: Annual convention, Hotel Waldorf-Astoria, New York. Institute address: 402 Albee Bldg., Washington. Executive secretary: George T. Underwood.

September 21, Cutting Tool Manufacturers Association: Fall meeting, Lochmoor Club, Detroit. Association address: 416 Penobscot Bldg., Detroit 26. Secretary: M. J. Ewald.

September 21-22, Steel Founders' Society of America: Fall meeting, The Homestead, Hot Springs, Va. Society address: 920 Midland Bldg., Cleveland. Secretary: F. Kermit Donaldson.

September 21-23, Truck Body & Equipment Association Inc.: Annual meeting, Sheraton-Gibson hotel, Cincinnati. Association address: 1122 DuPont Circle Bldg., Washington 6. Executive manager: Arthur J. Nuesse.

September 21-24, American Mining Congress: Annual metal and nonmetallic mineral mining convention, Olympic hotel, Seattle. Congress address: 1102 Ring Bldg., Washington 6. Executive vice president: Julian D. Conover.

September 21-25, Instrument Society of America: National instrument conference and exhibit, Hotels Morrison and Sherman, Chicago. Society address: 1319 Allegheny Ave., Pittsburgh. Manager: P. V. Jones Jr.

September 23-25, National Industrial Conference Board Inc.: General session for all associates on marketing, Hotel Waldorf-Astoria, New York. Board address: 247 Park Ave., New York 17. Secretary: Herbert S. Briggs.

September 23-26, National Association of Foremen: Annual convention, Milwaukee. Association address: 321 W. 1st St., Dayton 2, O.

September 28-30, American Management Association: Personnel conference, Hotel Statler, New York. Association address: 330 W. 42nd St., New York 36. President: Lawrence A. Appley.

September 28-30, National Electronics Conference Inc.: Annual conference, Hotel Sherman, Chicago. Conference address: 852 E. 83rd St., Chicago. Executive secretary: Karl Kramer.

September 28-October 1, Association of Iron & Steel Engineers: Annual meeting, Hotel William Penn, Pittsburgh. Association address: 1010 Empire Bldg., Pittsburgh. Managing director: T. J. Ess.

September 29-October 3, Society of Automotive Engineers: National aeronautics meeting, aircraft engineering display and aircraft production forum, Hotel Statler, Los Angeles. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

September 30-October 2, Porcelain Enamel Institute: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute address: 1346 Connecticut Ave., NW, Washington 6. Secretary: John C. Oliver.

Remote Control of Air

Four-way type electro valve for remote control of air operated, mechanical devices is being sold by Sciaky Bros., Inc., Chicago.

Valve is completely automatic. It controls all types of machinery using single or double-acting, pneumatic-power cylinders.

Operating on any 110, 220, or 440-volt, dc, 60-cycle power supply, the valve is capable of maintaining in consistent operation a speed of 500 strokes per minute.

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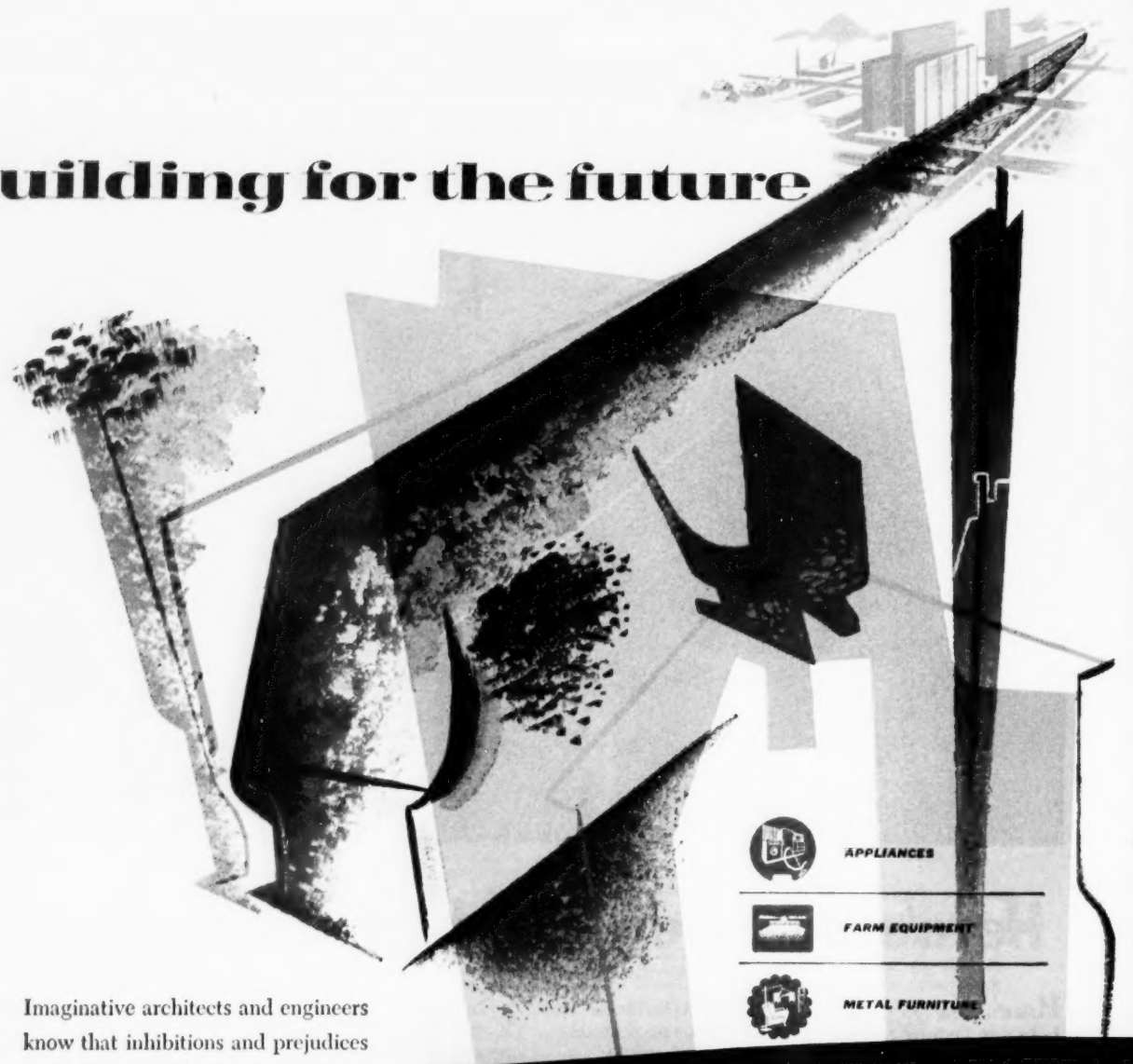
building for the future



Imaginative architects and engineers know that inhibitions and prejudices must be stifled if creative development is to have full freedom of expression. That's why many seemingly senseless drawing board doodles often emerge as revolutionary ideas in building technology.

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Timesaver for West Coast Production

Automatic dipping, draining and baking technique is applied to core and coil units for transformers rated up to 100 kva at Westinghouse's Sunnyvale, Calif. plant. While suspended from the conveyor, units are continuously immersed in insulating varnish, drained and then carried through a baking oven

Future Jet Blades...Castings or Forgings?

That's the question that will remain unanswered until 2000° F alloys are developed, according to NACA propulsion chief. And they're still in the talking stage

DESPITE months of intensive research by the Air Force and the aviation industry, no conclusive answer has been found to the question: Will turbojet engine blades in future be cast or forged?

No early answer is in sight for the reason that alloys have not yet been developed to meet the strength, impact resistance and corrosion resistance properties that will be demanded at the higher metal temperatures for which designers are preparing. Until such alloys become available, there can be no complete answer to the question as to whether the forming technique will be casting or forging—or perhaps compacting of metal powder.

That's the way William H. Woodward, chief, Propulsion Division, Washington office, National Advisory Committee for Aeronautics sums up the present outlook.

Vital Need—Problem is important because under wartime conditions millions of blades would have to be produced monthly to supply the needs for the axial-flow turbojets which would constitute the overwhelming portion of the jet plane arm. It further is important because of the severe operating conditions with which the blades have to cope—so that the number of hours a jet plane can function without overhaul depends on the quality of the blades.

Principal interest is in connection with the blades in the hot end of the engine. Here there is no present difficulty, since the blades now in production are intended to stand up under metal temperatures to around 1500° F—and they do this satisfactorily.

But the trend in jet engines is rapidly in the direction of higher metal temperatures and the designers are asking: What shall we use to go up to 2000° F?

Beyond Cobalt-Nickel—The answer, according to Mr. Woodward is not likely to be found in cobalt or nickel alloys. Not only have these alloys been thoroughly explored and developed so as to obtain virtually all the high temperature characteristics that can be expected of them, but cobalt could not be relied upon since under full mobilization it would at once become too scarce. So, as researchers look at the picture, chromium and molybdenum appear the most promising of the metals in preparing for higher temperatures.

But obstacles exist in both cases. Alloys containing 50 per cent or more molybdenum are ductile and well suited for forging (no attempt has been made to use them in making cast blades) but they have extremely poor resistance to oxidation at high temperatures.

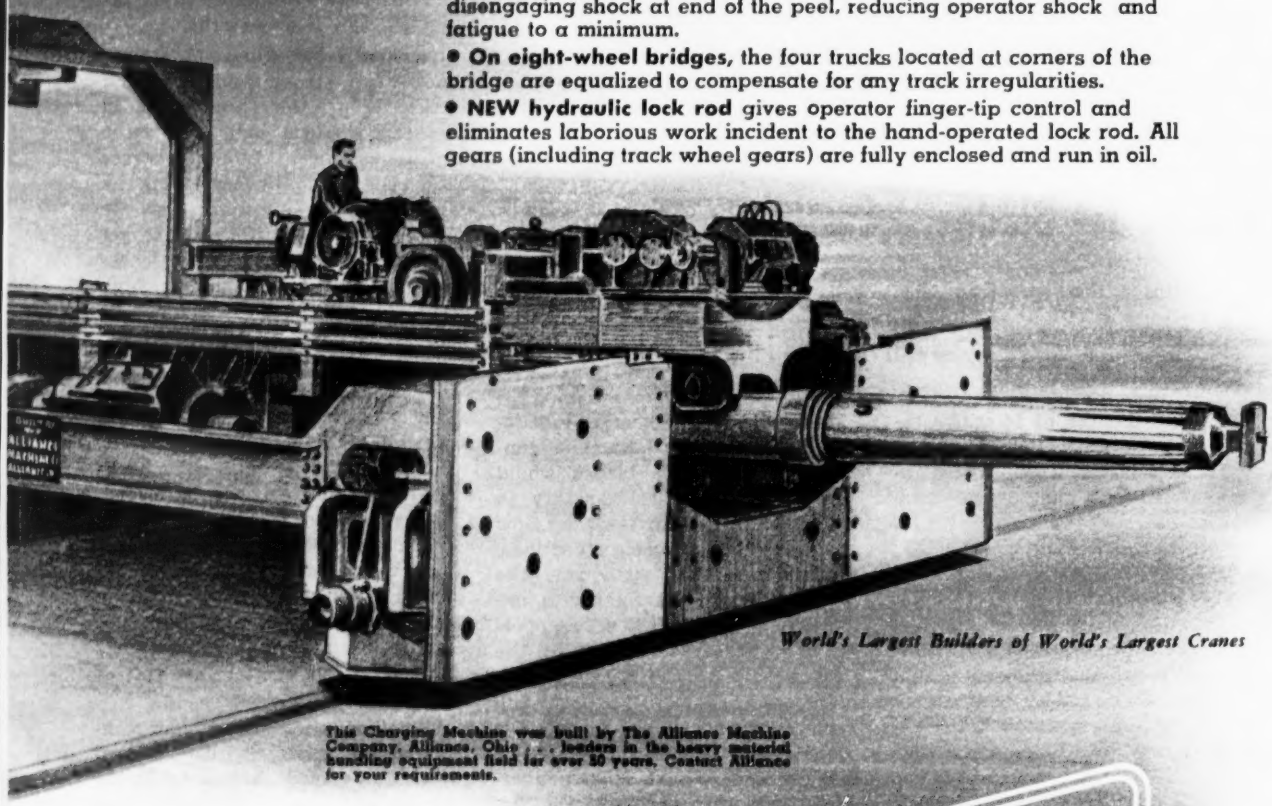
On the other hand, chromium alloys are strong and oxidation resistant but they are brittle in the forged form and even more so as castings. Little progress has been made in developing an answer to the question: Can we alloy chromium sufficiently to get ductility and reduce brittleness without losing strength at high temperatures?

Looking Ahead—If we do develop a suitably oxidation-resistant molybdenum alloy, or a combination of such alloy plus a protective coating, Mr. Woodward told STEEL, the probability is that turbine buckets for the hot end will be forged. If we develop a suitably ductile chromium-base alloy the reverse will be expectable. However, due allowance must be made in such a forecast for the disposition of many designers to favor forgings as permitting better control of physicals.

Another alternative under consideration is to fit the hot end with air-cooled hollow rotating blades and also possibly air-cooled hollow stator vanes, in which event the cheapest forming process would be preferred. Air-cooled blades offer the advantage from a materials standpoint in that they could be made of leaner alloys. But air-cooling wastes heat and reduces the efficiency of the engine so this approach is limited.

Powerful, Productive and Low with Spring-Loaded Pitman

- **The NEW Alliance 12-ton, low-type open hearth Charging Machine has spring-loaded pitman so, if the charging box pushes up over scrap in the furnace, the trolley's front wheels remain on the rails. Trolley always has sufficient traction to retract peel and box from furnace.**
- **Each bridge girder** of Alliance's NEW Charging Machines consists of two wide-flanged I-beams welded to form a box section. Between webs of this box section, diaphragms are welded at 3-ft. intervals. This, plus other welded reinforcements, keeps charging machine square and rigid.
- **Machinery deck plate,** extending full length of bridge between main girder and outrigger girder laterally reinforces the main girder and helps keep charging machine square and stable under all operating conditions.
- **Stabilized, shock-absorbing wheels** operate at rear end of trolley. Two rear wheels engage upper rail; two adjacent wheels engage lower rail. Powerful springs hold wheels in contact with rails at all times. This spring suspension absorbs and disperses engaging and disengaging shock at end of the peel, reducing operator shock and fatigue to a minimum.
- **On eight-wheel bridges,** the four trucks located at corners of the bridge are equalized to compensate for any track irregularities.
- **NEW hydraulic lock rod** gives operator finger-tip control and eliminates laborious work incident to the hand-operated lock rod. All gears (including track wheel gears) are fully enclosed and run in oil.



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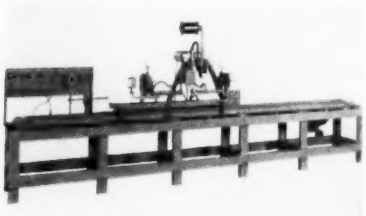
NEW PRODUCTS and equipment

Reply card on page 127 will bring you more information on any new products and equipment in this issue

Automatic Soldering Machine

. . . built as self-contained unit

Built as a completely self-contained unit, the Mogul soldering conveyor fixture needs only to be connected to gas, air and electricity to begin operation. Fixture has adjustable soldering horn with



movable rails that can be lowered or raised, moved in or out to conform to contour of various size parts to be soldered. Master control panel offers simple adjustment for flow of gas and air.

Gun, preheat burners and postheat burners are moved horizontally and vertically by micro-screw mechanisms. An automatic fluxing device supplies necessary flux to work. Metallizing Co. of America, Dept. ST, 3520 W. Carroll Ave., Chicago 24, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 1

Laminated Plastic Retainers

. . . bearing speed: 100,000 rpm

Precision bearings capable of attaining speeds in excess of 100,000 rpm are possible through use of thermosetting laminated plastics. Retainers for machine tools, grinding spindles, turbine and supercharger blowers, and aircraft instruments can be machined within tolerances required for precision and super-precision bearings. Retainers range from 0.143 to 33 inches OD. Synthane Corp., Dept. ST, Oaks, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 2

Rotary Wire Stripper

. . . adjusts to 0.001 inch

Model G-5 wire stripper is a precision rotary unit, using only a single blade which can be adjusted to within 0.001-inch. Model is designed to strip any insulation which can be cut through and then pulled off by withdrawing wire from stripper. It is limited to wires having maximum 0.255 inch diameter over the insulation.

According to the manufacturer,

the unit will not nick or damage bare wire because of single cutting blade design. Precision guide bushings provided to fit all wire to be stripped. Eraser Co. Inc., Dept. ST, 1068 S. Clinton St., Syracuse 4, N. Y.

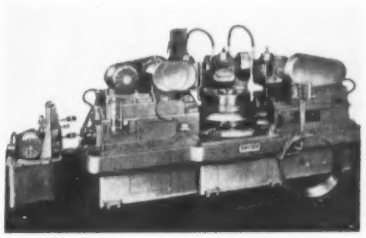
FOR MORE DATA—CIRCLE REPLY CARD NO. 3

Automatic Profiling Machine

. . . processes compressor casings

This automatic profiling machine processes jet engine compressor casings. The workpiece is a thin-walled cylinder made from stainless steel with four rows of lugs projecting from the outside like fins. Operation calls for profiling these lugs by milling to a depth of $1\frac{3}{8}$ inches at the extreme. Milling is done in three steps: Two rough cuts, one finish cut.

Machine consists of a fixture



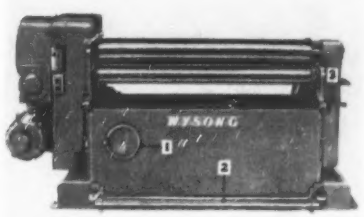
mounted on a rotary table driven by hydraulic fluid motor. Spaced around the table are three-way type milling units, each controlled by a Turchan follower hydraulic system. Snyder Tool & Engineering Co., Dept. ST, 3400 E. Lafayette, Detroit 7, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 4

Redesigned All-Steel Rolls

. . . save time, improve safety

Three timesaving and safety features are added to manufacturer's series C all-steel 5-inch rolls. First among these is fast, parallel adjustment of rear roll by means of a single handwheel located on



the machine front. Indicator scales are visible clearly from the front.

Safety treadle extends full length of the front. Depressing

ROLLWAY Bronze-Retainer Roller Bearings
From 30" O.D. to 3" O.D.!
Regardless of size—regardless of type, radial or thrust—Rollway Roller Bearings roll right because they're made *right*. Net result of Rollway's precision "right angle design" is longer bearing service—under heavier loads—with lower maintenance cost.

RIGHT ANGLE Roller ends, precisely square to avoid end-rub, oscillation and side-shock.
RIGHT ANGLE Bearing surfaces with parallelism that results in unwavering right-line rolling.
RIGHT ANGLE Separator slots accurately machined to prevent roller skew, slide and uneven wear.

• Rollway Bearing replacements are available through authorized bearing distributors in principal cities. Consult your classified 'phone directory.

Our complete engineering and metallurgical services will gladly work with you on your problems. Simply write or wire any sales office. No cost. No obligation. Rollway Bearing Co., Inc., Syracuse 4, N. Y.

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ROLLWAY® BEARINGS

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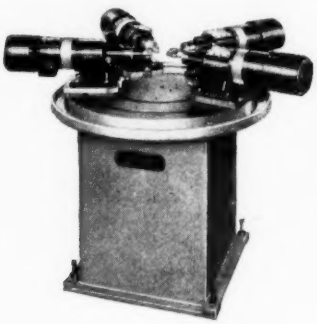
treadle from any position immediately breaks electrical circuit and stops the machine. Circuit remains broken until the machine is reactivated at pushbutton station. The top roll raises automatically with the lowering of drop end. Wysong & Miles Co., Dept. ST, Greensboro, N. C.

FOR MORE DATA—CIRCLE REPLY CARD NO. 5

Radial Hole-Drilling Machine

. . . up to eight drilling units

This standard machine makes special units for drilling radial holes unnecessary in a great variety of parts. Any number up to eight of the company's automatic drilling units can be employed. Each is movable not only through



360 degrees on the circular table, but also endwise on riser plates to meet requirements of the part being drilled.

The machine can also be used for tapping operations. A single button actuates all units simultaneously. Govro - Nelson Co., Dept. ST, 1931 Antoinette, Detroit 8, Mich.

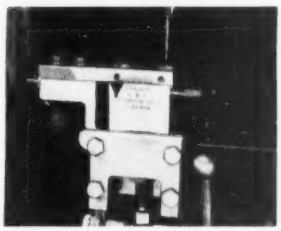
FOR MORE DATA—CIRCLE REPLY CARD NO. 6

Workholding Fixture

. . . for cross-drill jobs

Cross drill fixture, called Tymsavr, can be clamped quickly and securely to the swing table of an ordinary drill press to provide standard setup for most production cross drill jobs. Eliminated is expense and time of having fixtures designed and made for such drilling operations.

Fixture has two drill hole positions in the bushing plate that accommodate standard hardened



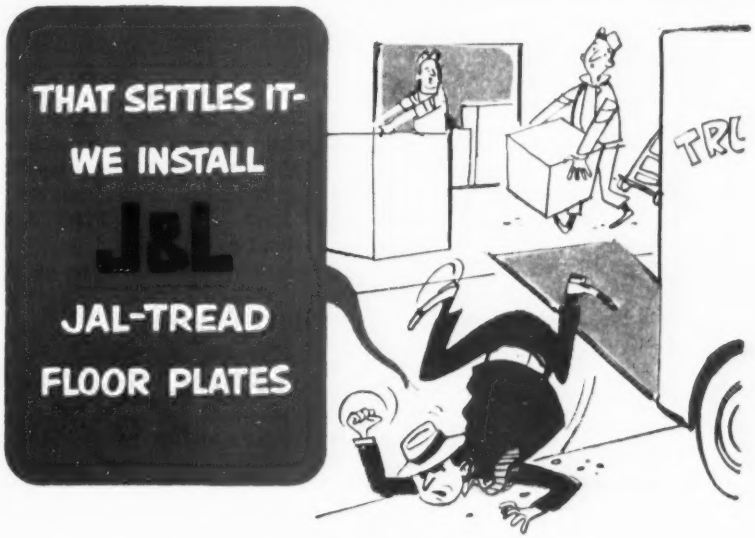
drill bushings. Bushings are interchangeable up to ⅜-inch drill hole size. C & J Screw Machine Products Inc., Dept. ST, 445 S. Line St., Columbia City, Ind.

FOR MORE DATA—CIRCLE REPLY CARD NO. 7

Tier Lift Truck

. . . services large presses

In servicing large presses, this tier lift truck cuts downtime by reducing time consumed when one die is exchanged for another. Machine operator secures his new die from the rack storage and places it on the top roller shelf. At the



The safety of your employees and the public is good enough reason to install walking surfaces of slip-resistant J&L Jal-Tread floor plate.

But here are some other important advantages you'll get when you specify Jal-Tread, the only true checker-board floor plate.

- Reduced worker fatigue from feet rocking on uneven surfaces.
- No wheel shimmy in hand industrial trucks.
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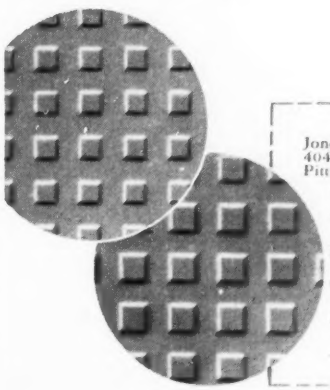
- Easy fabrication—square design allows cutting without shearing through raised cleats . . . permits welding joint of uniform thickness.
- Easy cold-forming on standard equipment.

Mail the coupon for more information today. You'll find J&L Jal-Tread will pay off in greater safety . . . lower maintenance costs.



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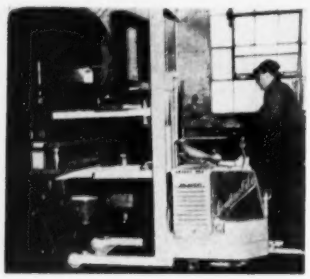
press, he moves the old die onto the bottom roller shelf, replacing it with the new unit.

Result: No extra handling; one trip suffices. The company also incorporates in this truck model its gas-electric drive. This allows



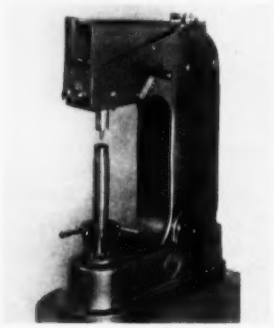
for continuous operation of the machine without charger. Also incorporated: Three-speed automatic control, allowing the operator to start and run his machine with practically no shock from sudden starting. Market Forge Co., Dept. ST, Everett, Mass.

FOR MORE DATA—CIRCLE REPLY CARD NO. 8

Key Chuck Attachment

. . . impossible to misplace

Operators waste no time searching for misplaced chuck keys when this attachment is fastened to drill presses to keep key handy. Key-



Bak is a key-roll with strong Swedish clock spring mechanism, 24-inch long steel chain and polished chrome case. Lummis Mfg. Co., Dept. ST, 2242 E. Foothill Blvd., Pasadena 8, Calif.

FOR MORE DATA—CIRCLE REPLY CARD NO. 20

Compact Industrial Heater

. . . ordinary orange crate size

Complete heating unit with potential of an average furnace and dimensions of an ordinary orange crate produces 60,000 Btu's of fresh air output per hour, weighs 114 pounds. Self-contained heater includes centrifugal pressure-type dual blower that separates the

ventilating air from combustion air while using only one motor.

Model burns fuel oil or gasoline in any weather. Perfection Stove Co., Dept. ST, 7609 Platt Ave., Cleveland 4, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 21

Hold-Down Vise

. . . eliminates complicated setups

Double ½ vise allows loading and unloading of jig borers, millers, planers and shapers by loosening one adjusting screw on the opposing clamp. Its hinged spring loaded jaw secures workpieces rigidly to any machine tool. J & S Tool Co. Inc., Dept. ST, 644 W. Mt. Pleasant Ave., Livingston, N. J.

FOR MORE DATA—CIRCLE REPLY CARD NO. 22

Pocket Pyrometer

. . . surface, subsurface reading

Model 240-T pocket pyrometer has 2.4-inch direct-reading indicator scale. It produces quick, ac-

curate measurement of surface and subsurface temperatures through use of interchangeable thermocouples.

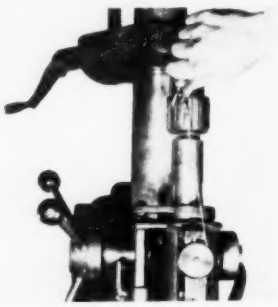
The model is encased in a shock absorbing rubber case, and is available in five standard ranges. Cybertronic Corp. of America, Dept. ST, 136 8th St., Upland, Chester, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 23

Metal Hardness Testers

. . . automatic load-changing

These hand-operated metal hardness testers provide automatic load changing and magnified optical reading features in standard models. The instruments are the Galileo superficial hardness tester, providing loads starting at 5 kgm;



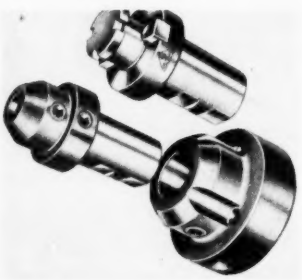
and the Galileo standard hardness tester, handling Rockwell measurements from 30 to 1000 Brinell. Opplem Co. Inc., Dept. ST, 352 Fourth Ave., New York 10, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 9

End Mill Adapter

. . . holds 2-inch mills

Heavy-duty end mill adapter and auxiliary equipment holds 2-inch straight shank end mills, in addition to specially-developed and standardized shell end mill arbors and end mill holders for smaller diameter mills.



In addition, tooling costs are reported reduced when using auxiliary equipment with the adapter by providing a wider range of applications for standard cutters and increasing machine versatility. Adapter mounts directly on the front spindle flange to elim-

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ATLAS, ATLAS "B" AND
ATLAS "X" ROLLS

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Follansbee custom-quality Cold Rolled Strip can be delivered from the mill directly to you providing a continuous supply of uniform steel from coils to your automatics, regardless of forming operations involved.

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COLD ROLLED STRIP STAINLESS TERNE ROLL ROOFING
POLISHED BLUE SHEETS AND COILS
Sales Offices—Chicago, Cleveland, Detroit, Indianapolis, Kansas City, Los Angeles, Minneapolis, Nashville, New York, Philadelphia, Rochester, San Francisco, Seattle, Toronto and Montreal, Canada.
Mills—Follansbee, W.Va.
FOLLANSBEE METAL WAREHOUSES
Pittsburgh, Pa. Rochester, N.Y. Fairfield, Conn.

NEW PRODUCTS and equipment

inate need for draw-in bolt. Goddard & Goddard Co., Dept. ST, 12280 Burt Rd., Detroit 23, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 10

Light Bulb Changers

. . . adjustable 42-foot reach

Maintenance men can remain securely on the ground or floor and change bulbs, even broken ones, with this bulb changer. Lightweight aluminum sectional poles can be adjusted to 42 feet.

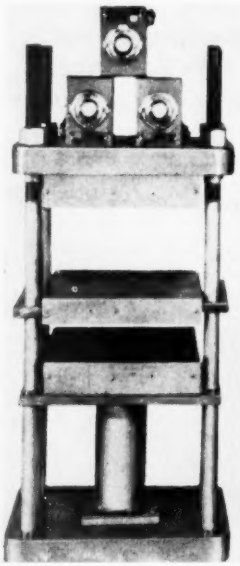
Changer attachments are available for various size bulbs from 15 to 1500 w. J. B. Sebrell Corp., Dept. ST, 300 S. Los Angeles St., Los Angeles 13, Calif.

FOR MORE DATA—CIRCLE REPLY CARD NO. 11

Hydraulic Presses

. . . meet specific requirements

Four-post hydraulic presses are designed to meet specific needs of small mechanical rubber and plastic molding shops. These multiple-opening units are available in 10, 20 and 30-ton pressure capacities to accommodate 6 x 6, 8 x 8 and



USE A **REPLY CARD**

Just circle the corresponding number of any item in this section for more information.

AVAILABLE FOR THE ASKING

69. Fork Truck Chart

Lewis-Shepard Products, Inc.—You, as a potential buyer of a fork truck, can make comparisons of various truck makes with this comparison chart that lists 27 buying guides. Space is provided for analysis on the file-size reference chart.

70. Drill Stops

Scully-Jones & Co.—A positive control for depth of hole is given by the line of drill stops described and illustrated in 4-page bulletin 18-50 and price sheet. Standard stock sizes, special models and applications are covered.

71. Plastics Products

New York Belting & Packing Co.—Available in pipe moldings, extrusions and fabrications, Indestructible plastic, its properties and the products fabricated from it are described in new booklet. Composition can be varied to give a considerable range of properties, and compound is noncontaminating, odorless, tasteless, nondiscoloring, shatterproof and has excellent chemical resistance.

72. Bench Type Millers

Barker Engineering Co.—The production model Barker bench type milling machine is described in illustrated bulletin B.E.S. Unit is fitted with three-way hand lever travel, and is sufficiently rigid for use with carbide cutters. Bulletin has all specs.

73. Quench-Oil Equipment

Bell & Gossett Co.—Self-contained quench-oil cooling equipment is subject of catalog FB-1052. Data includes dimensional information and selection pointers on Kleenwell, Junior and Perambulator units.

74. Carbon-Graphite Products

United States Graphite Co.—70-page handbook GT-54 tells the complete story of Graphitar, a carbon-graphite product with high physical properties with many applications, including seals, cylinder liners and packings. A complete picture is given to the reader, with design, physical, manufacturing, fabricating and other properties. Product has good wearing qualities, is chemically inert and is practically unaffected by high speeds, temperatures and pressures.

75. Heat-Treating Furnaces

Lindberg Engineering Co.—Covering gas fired and electric Super Cyclone heat-treating furnaces, illustrated bulletin 131 contains photos, diagrams and specifications of these units. Operation, design features and such applications as annealing, nitriding, normalizing and tempering are briefly explained.

76. Hard-Facing Electrodes

Alloy Rods Co.—For correction of wear-patterns, Wear-Arc hard-facing electrodes in many different grades are subject of 12-page illustrated catalog. Process data are given together with specific information on different jobs, and double-page table is helpful in applying correct practices. Properties of each type are given.

77. Finned Coils

Bush Mfg. Co.—Covering the complete line of finned coils, including water, direct expansion and steam types, available catalog contains specifications, on all types, as well as engineering and construction data which simplifies specifying and ordering. Featured are pre-engineered coils in stock sizes rated at standard conditions.

78. Air-Cooled Engines

Wisconsin Motor Corp.—64-page informative booklet Form S-150 features a myriad of pictures showing Wisconsin heavy duty air-cooled engines at work in agriculture, construction, industrial, materials handling, oil field, railroad and specialized service. Dimensional drawings, specifications and power curves are given on one to four cylinder models ranging from 3 to 36 hp. How engines are made is pictorially told as well.

8-10-53

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79. Time-Cycle Controllers

Bristol Co.—Information is given in 12-page bulletin C305 on the application of time-cycle controllers in timing industrial process operations, such as used in manufacture of rubber goods, molded plastics, dry ice, tires, rayon, woolen goods and others. Various models available are liberally illustrated and operating principles are detailed.

80. Jig Grinding Spindle

Vulcan Tool Co.—An air-driven jig grinding spindle is illustrated and described in this 6-page folder. Unit fits most machine tools in same way as a boring chuck and has controllable spindle speeds from 30,000 to 50,000 rpm. Specs, complete accessories listing and descriptions are given.

81. Beryllium Alloys

Beryllium Corp.—When you send for 20-page illustrated "Product Directory" you will get information on beryllium copper and beryllium aluminum master alloys, beryllium copper wrought products, available alloys and forms, casting ingots and other beryllium products, including castings, nonsparking tools, forgings, beryllium oxide, beryllium metal and ferro-beryllium.

82. V-Belt Drives & Sheaves

Pyott Foundry & Machine Co.—56-page illustrated catalog V-1000 has revised data on Vee-Tex belts and Pyott sheaves, including complete specs, available drives, belt centers, dimensions and engineering information. Taper-Tight bushings are featured in sheaves. Much data are in table form.

83. Mastic Floorings

Bitucote Products—Advantages of Bitucote mastic flooring are effectively illustrated in 4-page folder identified as A.I.A. file No. 23-D. Easy to mix and to apply, product can be applied over worn wood or concrete floors. Its use for underlayment is also cited.

84. Steel Anchor Plates

Armco Drainage & Metal Products, Inc.—Illustrated folder STEL-2252 shows applications of Stelcon anchor plates for floor installations where optimum wear resistance is necessary. Individual plates are fabricated from 11-gage steel, and are designed to imbed directly into a concrete floor base.

85. Portable Power Tools

Syntron Co.—In 32 illustrated pages, catalog No. 537 gives a complete picture of company line of electric hammers and hammer drills, saws, drills, screwdrivers, impact wrenches, concrete vibrators and polishers, sanders and grinders. It also features gasoline-powered rock drills and paving breakers. Each unit is given separate treatment, with illustration, operating data and complete specifications.

86. Wire Rope Assemblies

Macwhyte Co.—Line of Safe-Lok wire rope assemblies applicable for operating controls, as a part of machinery and equipment, or for slings and hoists, is described and illustrated in 24-page illustrated catalog 5201. Dimensional drawings, specifications, ordering and general information are included, as are data on wire rope for assemblies.

EDITORIAL ARTICLES
Available in Limited Quantities

87. British Plant Expanded

"British Streamline Tin Plate Lines" is title of STEEL article which relates how U. S. know-how and equipment is helping to modernize the Trostre tin plate mill. Plant covers 746,000 sq ft and has rated output of 500,000 tons of tin plate per year.

88. Steel Warehousing

Steel warehousing at Art Metal Construction Co. is an overhead operation which can move 150 tons of steel per day with one handling between truck and storage. Manhours are cut to one-third and output of six shears is increased. Read STEEL article "Warehousing Moves Overhead."

89. Cold Extrusion

Tooling for cold extrusion of steel is still a problem on some applications, but it's being solved as the process expands its field to new applications and new steels. Bob Huber, Machine Tool Editor, reports on this expansion in STEEL article "Cold Extrusion of Steel" and gives consideration to such factors as tooling, lubrication and presses.

90. Shot Blasting

Big one-piece cast steel hulls for Patton tanks posed a real cleaning problem. Erle F. Ross, Chicago Editor, tells how American Steel Foundry licked the problem and turned hours into minutes in STEEL article "Tank Castings Get Shot Blasted." Castings are rotated under nine blasting wheels by 17½-ft turntable.

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NEW PRODUCTS and equipment

12 x 12-inch platen sizes.

Platens are electrically heated and thermostatically controlled to 450° F. Presses are adaptable for operation with a hand pump or can be powered by existing shop central hydraulic system. Cylinders are built for 3000 psi operation. M & N Hydraulic Press Co., Dept. ST, 780 Route 3, Allwood, Clifton, N. J.

FOR MORE DATA—CIRCLE REPLY CARD NO. 12

Nonhygroscopic Flux

. . . improves aluminum joining

Development for those who join aluminum in production is a nonhygroscopic flux that minimizes or eliminates entirely the problems of corrosion. Flux lowers surface tension and provides greatly improved wettability, according to the manufacturer.

It eliminates corrosion caused by absorption of water from atmosphere. Eutectic Welding Alloys Corp., Dept. ST, 40-40 172 St., Flushing, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 13

Compact Lift Truck

. . . permits varied ballasting

The Models F-4R and F-6R power lift trucks, with 4000 and 6000 pounds capacity respectively, are designed for both outdoor and indoor use where a smaller, compact truck is needed. Trucks feature large pneumatics on all wheels, complete operator vision from comfortable seat right behind mast, and have a 12-inch center underclearance.

Short wheelbase, turning radius enable these models to maneuver in close quarters and the ballast box over the rear steering wheel permits varying the balance weight to assure proper traction and balance under all conditions.

Besides standard forks, others

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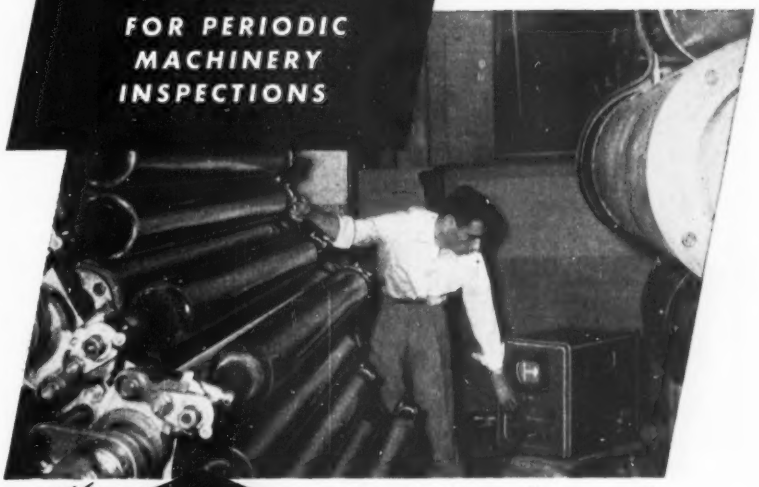
Reduce SHUT-DOWN Costs

FOR PERIODIC MACHINERY INSPECTIONS



Inspecting inking rolls on a printing press . . . without disassembly.

with Sperry

Ultrasonic REFLECTOSCOPE TESTING

NOW AVAILABLE FOR ANY DESIRED TERM THROUGH ECONOMICAL SPERRY INSPECTION SERVICE

Sperry Ultrasonic Testing makes it possible to conduct your periodic inspections of machinery and other production equipment rapidly and dependably without time and money-wasting disassembly. Penetrating up to 30 feet in solid metal, this latest and finest of the non-destructive testing methods locates hidden defects not detectable by the most careful visual inspection.

In addition to speeding up inspection periods, Ultrasonic Testing prevents on-the-job equipment failure by finding sub-surface flaws; needed repairs can be scheduled for slack periods.

Reflectoscope Testing is available when you need it on an economical basis. Hire an experienced inspection engineer using a Sperry Reflectoscope for any desired time from 4 hours up.

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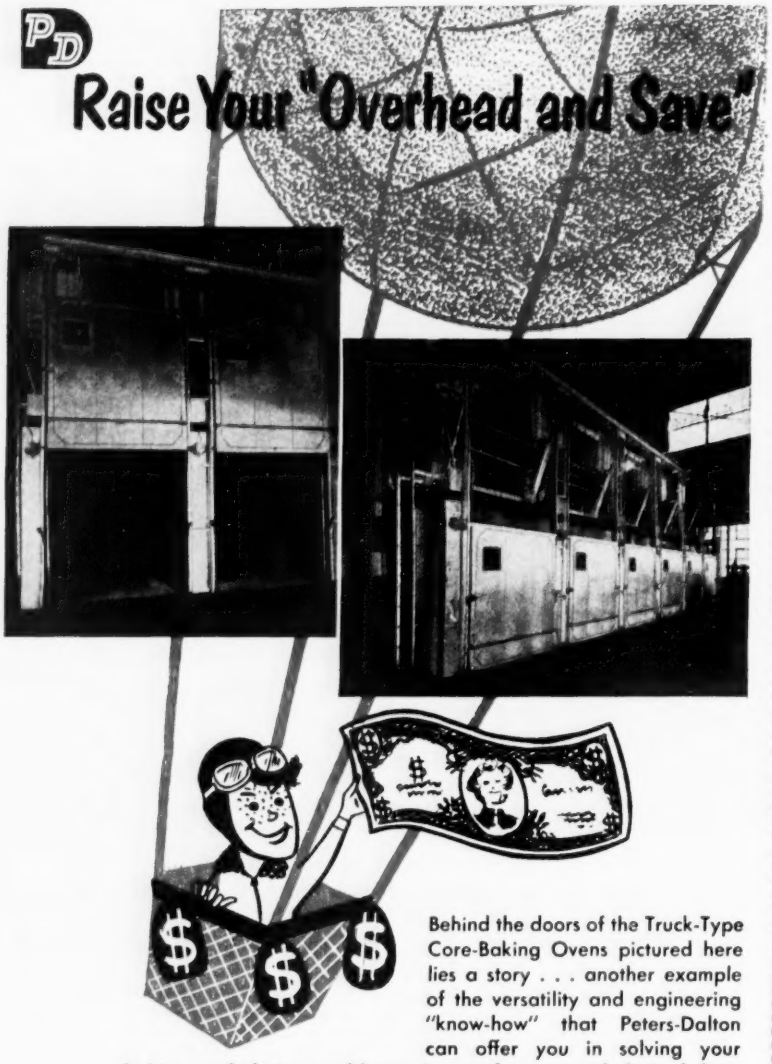
Raise Your "Overhead and Save"



Behind the doors of the Truck-Type Core-Baking Ovens pictured here lies a story . . . another example of the versatility and engineering "know-how" that Peters-Dalton can offer you in solving your baking and drying problems. A manufacturer with limited floor space wanted core-baking ovens installed that would be easily and quickly accessible for plant trucks when handling cores for baking. PD engineers studied his production requirements and space limitations—designed and installed this cost-cutting, efficient and compact core baking system. Overhead doors lift automatically to permit truck placement of pallets in the spacious core ovens with this overhead installation. Handling time is cut to the minmum; the most is made of limited space.

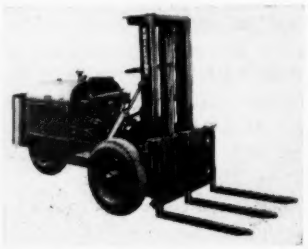
PD engineering experience and production ability can open "doors" for *you*—doors that seem closed due to inadequate facilities, space limitations, or poorly designed equipment. PD engineers can design the oven best suited to your special requirements. For more detailed information—write, wire or phone.

Hydro-Whirl Paint Spray Booths *Industrial Washing Equipment*
Drying and Baking Ovens *Hydro-Whirl Dust Collecting Systems*

Peters-Dalton INC.
17892 Ryan Road • Detroit 12, Michigan

NEW PRODUCTS and equipment

are available for specific jobs, also fork sideshifter, hydraulic scoop and other attachments. Standard



lift is 108 inches, lowered height is 80 inches. Erickson Power Lift Trucks, Inc., Dept. ST, 1421 Marshall St. N. E., Minneapolis 13, Minn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 14

Galvanized Shielded Enclosures

. . . suppress radio interference

Radio-frequency radiations from industrial and laboratory equipment are suppressed by these galvanized single-shield enclosures. Enclosures consist of a number of standard size panels bolted rigidly from the inside. They can be erected, enlarged or dismantled within a few hours. Ace Engineering & Machine Co., Dept. ST, 3644 N. Lawrence St., Philadelphia 40, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 15

Industrial Vacuum Cleaner

. . . electronic shutoff, brush savers

The features of electronic shutoff and stabilized motor brushes, heretofore available on the com-

pany's larger models, are now standard equipment on the 5-gallon model. With the motor shut off no water can enter the vacuum blower and motor even though user

RUSH YOUR SALES DEPARTMENT A PRICE CUT

DO YOUR STAMPING PROGRESSIVELY ON HENRY & WRIGHT DIEING MACHINES

Figure it out. If you could produce dozens of different jobs on one press . . . if you could combine separate operations into one progressive sequence . . . if you could improve accuracy, get higher speeds with longer die life . . . and yet grind less metal off the die to sharpen it . . .

If you could get these cost-cutting, labor-saving, inspection-reducing benefits, you wouldn't wonder whether you could afford a Henry & Wright Dieing Machine now. You'd decide, "How can I afford to be without it now?" Well, let's talk serious business, because those are just the benefits everyone gets with Henry & Wright Dieing Machines —and, brother, how the Sales Department will love that price cut you'll give them.

HENRY & WRIGHT DIEING MACHINES . . . A PROFIT WITH EVERY STROKE

Only the best is good enough

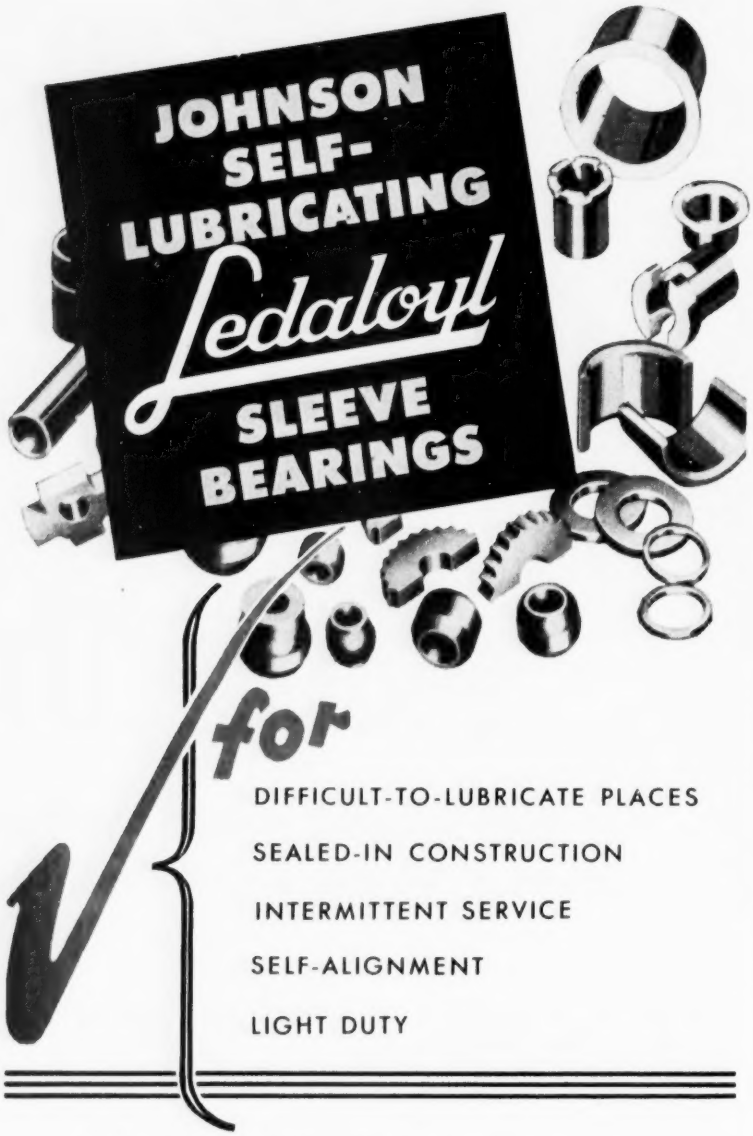
H&W

HENRY & WRIGHT

DIVISION OF EMHART MFG. CO.

HARTFORD 1, CONNECTICUT

NEW CATALOG Get up-to-the-minute facts on Dieing Machines — capacities range from 25 tons to 2500 tons. Write Henry & Wright, 441 Windsor St., Hartford, Conn.



POWDER METALLURGY made possible this versatile bearing . . . molded pre-cast bronze alloy powder impregnated with oil for self-lubrication. Myriads of tiny, evenly spaced pores serve as miniature oil wells. When the bearing is in use the oil is metered to the shaft . . . when at rest, the oil is reabsorbed by the bearing. These Ledaloyl bearings are widely used for small motors and fans, and have wide acceptance for self-aligning applications. Their extremely low cost, (no machining necessary), makes them practical for use in many types of equipment where heavy duty is not a factor. A wide selection of plain, single flanged, double flanged and self-aligning Ledaloyl bearings is available from distributors' stocks, while special sizes and styles of bearings and parts can be made to order. Write for complete information.

JOHNSON BRONZE CO., 550 South Mill St., New Castle, Pa.

JOHNSON JB BEARINGS
Sleeve-Type

OTHER BEARING TYPES:
General Purpose (GP) • Electric Motor (EM) • Graphited • Universal Bronze Bars • Babbitt

NEW PRODUCTS and equipment

fails to empty collection tank. A single drop of water passing the intake will open the motor circuit and stop the machine.

New assembly design holds brushes at right angles to motor armature thus causing them to wear evenly. Some brushes have given from 1200 to 1500 operating hours, and the holder is so designed that, when brushes do wear past the safe point, machine will not operate until they are replaced. Multi-Clean Products, Inc., Dept. ST, 2277 Ford Pkwy., St. Paul 1, Minn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 16

Conveyor With Guard Rails

. . . no material falls off

New line of gravity wheel conveyors is equipped with guard rails adjustable up to 5 inches on each side, and adjustments are easily made by hand screw clamps. While permitting wide objects to overhang conveyor section, rails eliminate possibility of falloffs and pro-

vide smooth, unobstructed flow of material.

Conveyors with adjustable guard rails are available in standard widths of 12, 14, 18 and 24 inches with 6 to 36 wheels per foot. Sage Equipment Co., Dept. ST, 30 Essex St., Buffalo 13, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 17

Safety Trolley System

. . . high current, high safety

Heart of this system is the collector shoe which may be increased or decreased in length to increase or decrease its current carrying capacity. Collectors can be made to carry from 50 to 2,000 amperes. Collector shoe is mounted on a ball and socket stud, which permits it to rock in any direction; shunt wires pass the current directly to

TOOL SHOP SHORT CUT—

A DELTA Drill Press on Every Work Bench Saves Time and Money for BINGHAMTON DIE & MACHINE CO.

"It's much cheaper to install an individual 14" Delta drill press on every diemaker's bench than to move men and machines," says Frank Bowie, owner of this thriving Binghamton, N.Y., shop.

No waiting, no running back and forth—a Delta drill press on every work bench increases Binghamton Die & Machine Co. profits.

Making dies for big shoe factories is his main business, and on most jobs more than half the operations are done on a Delta drill press.

"Accuracy is absolutely essential," says Mr. Bowie, "and we've had remarkable service from our Delta drill presses—for 16 to 18 years, in some cases. At times we use them as arbor presses, and still they stay accurate. They're not babied, either—used night and day in rush periods. Maintenance cost is negligible—no more than $20 per year on all our Delta equipment."

In addition to 18 Delta 14" drill presses, the company has a 17" drill press, three Delta grinders, a 14" bandsaw and a disc grinder.

You, too, can save money with low-cost, high accuracy Delta tools. It costs you so little to have Delta tools throughout your shop—they're ready to use without waiting, eliminate set-up for special jobs, and are easy to relocate at any time.

Do you have up-to-date Delta literature? Send for Catalog AB-52; and call the Delta dealer—listed in the Classified Telephone Directory under "Tools." Write Delta Power Tool Division, Rockwell Manufacturing Company, 638H Lexington Ave., Pittsburgh 8, Pa.

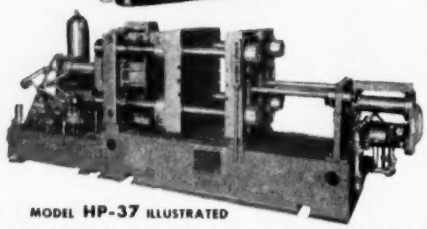
Delta drill presses are available in floor and bench models.

DELTA QUALITY POWER TOOLS

Another Product of **Rockwell**

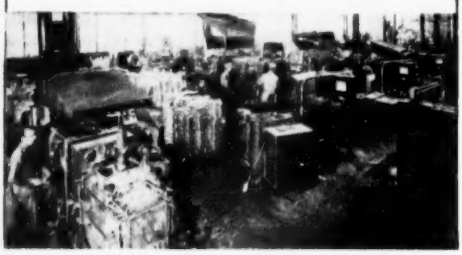
KUX

FIRST NAME IN DIE CASTING MACHINES



MODEL **HP-37** ILLUSTRATED

Hydraulically operated die casting machine for production of aluminum castings.



Battery of KUX Die Casting Machines in operation in the ultra-modern Maytag factory at Newton, Iowa

—helps make

Maytag

first name in washers

Since 1907, over 6 million Maytag Washers have been sold—far more than any other. The reason's clear; Maytag makes a wonderful washing machine . . . plus a full line of other home laundry equipment and famous Dutch Oven Ranges. It's logical that KUX, first name in die casting machines, should be used in the quality production of these superior products.

The use of KUX die casting equipment can put YOUR PRODUCT ahead—or *keep* it ahead. Reduce your manufacturing costs—increase the saleability of your product, with quality die castings made on these rugged machines.

Write for illustrated catalog showing complete line of KUX Die Casting Machines

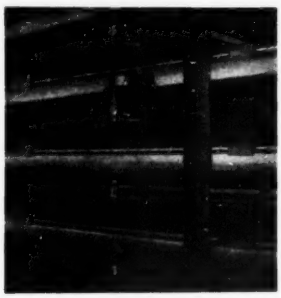
KUX MACHINE COMPANY
6725 N. Ridge • Chicago 26, Illinois

KUX

FIRST NAME IN DIE CASTING MACHINES
SELECTED BY FIRST NAMES IN INDUSTRY

the main demand lead wire of the system.

Truncated "V" formed into the extruded copper conductor bus, fits the correspondingly truncated edge of the collector shoe increasing the area of electrical contact. Both collector shoe and conductor bus



are shielded by a snug-fitting rubber covering as both a safety feature and a protection benefit. Universal-Standard Inc., Dept. ST, 633 Washington Rd., Pittsburgh 28, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 18

Portable Pneumatic Riveter

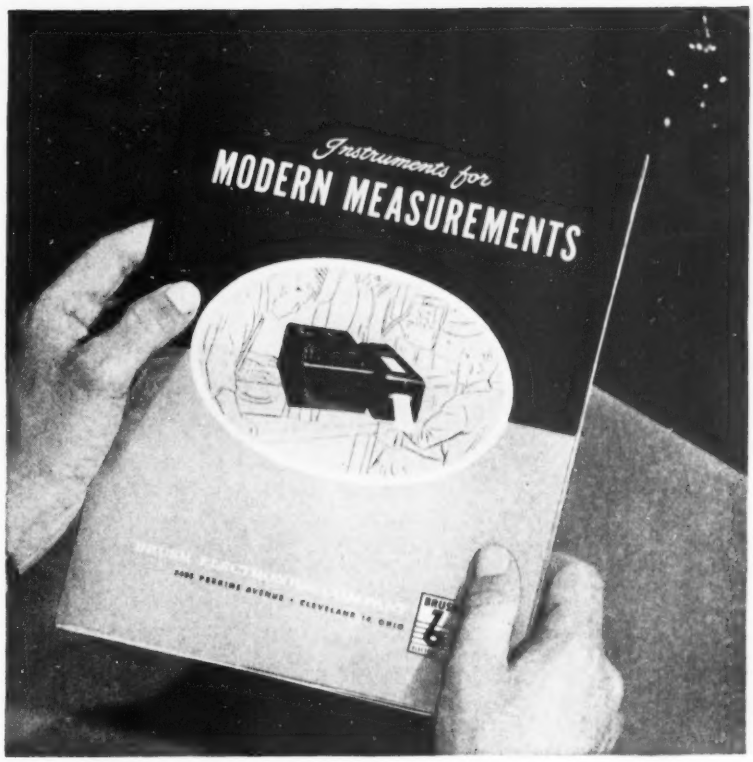
. . . features rotating impact

A compact and balanced hand tool, this portable pneumatic riveter features rotating impact. Tool requires only a slight steady pressure for proper operation. Manufacturer reports its riveter tends to feed itself.

Spinning action eliminates extreme jumping and contributes to

smooth operation. Among operating features: The 7-pound, 15-inch-long tool reaches difficult places, provides a quality job on short-run operations and saves on handling and setup time. Lemert Engineering Co., Dept. ST, Plymouth, Ind.

FOR MORE DATA—CIRCLE REPLY CARD NO. 19



NEW IDEAS IN MEASUREMENT

Can they help you improve your products?

FACTS ON STRESS, strain, vibration and other characteristics can help you improve the design and performance of your products. Brush instruments help you get design and operating data easily and quickly. The applications of these instruments, and many new ideas that may help solve your particular measurement problems, are presented in this new booklet "Instruments for Modern Measurements". Send for your free copy today.

BRUSH ELECTRONICS COMPANY

formerly The Brush Development Co. Brush Electronics Company is an operating unit of Clevite Corporation.

INDUSTRIAL AND RESEARCH INSTRUMENTS
PIEZO-ELECTRIC MATERIALS • ACOUSTIC DEVICES
MAGNETIC RECORDING EQUIPMENT
ULTRASONIC EQUIPMENT

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Electrical Measurements
Physical Measurements
Surface Measurements
Resistance-Welding Measurements
Ultrasonic Energy Applications
Electro-Acoustical Measurements
Textile Measurements

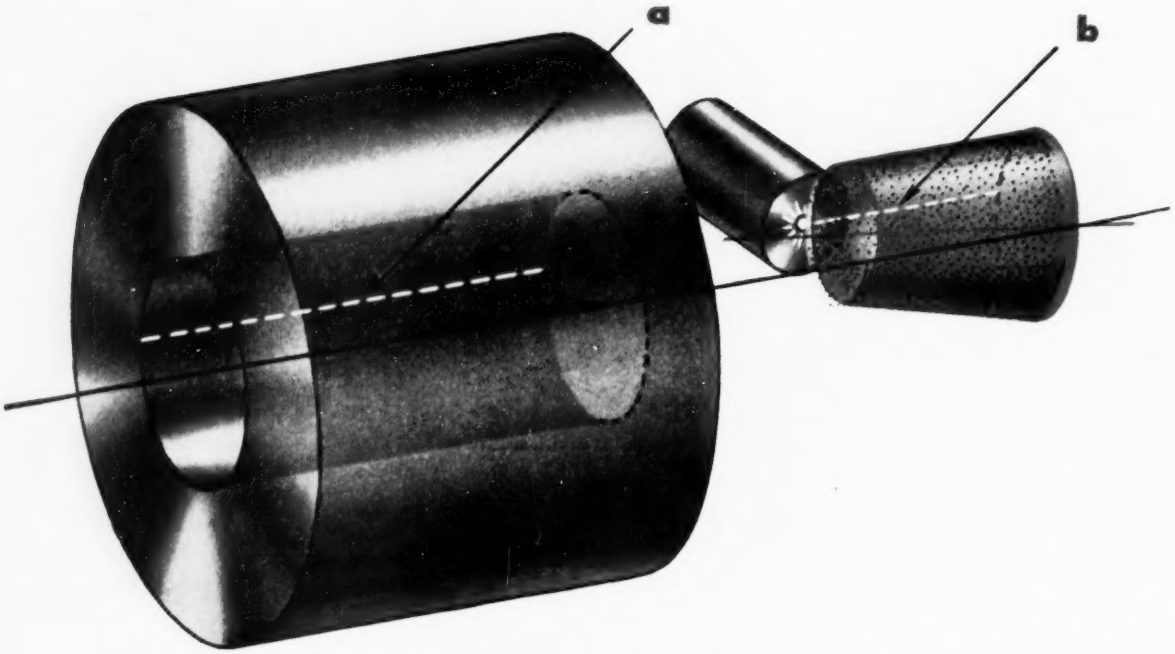
BRUSH ELECTRONICS COMPANY, DEPT. PP-8
3405 Perkins Avenue, Cleveland 14, Ohio

Please send free copy of "Instruments for Modern Measurements".

Name _____
Company _____
Title _____
Address _____
City _____ *State* _____

alignment

for better internal grinding

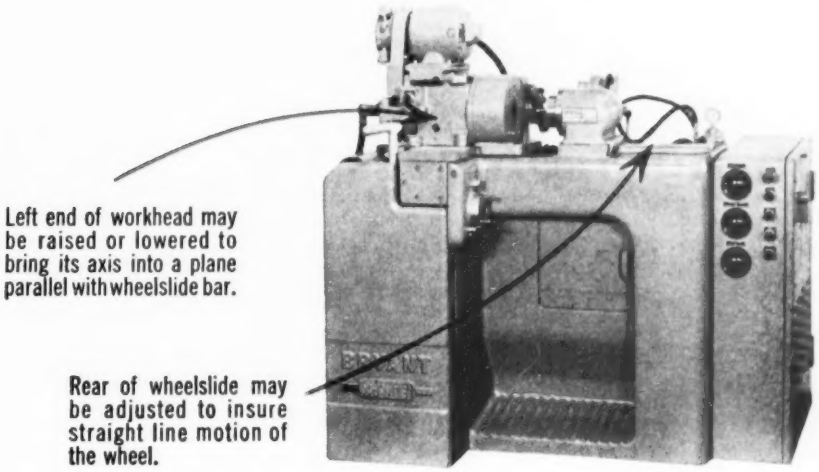


GRINDING a straight hole on an internal grinder is normally done with a straight (cylindrical) wheel. It is sometimes desirable to turn the wheelhead and dress the wheel to a taper in order to use a more rigid projection. However, this setup presents some serious obstacles which cannot be overcome unless they are clearly understood. In order to grind a straight hole the various elements of the machine must be in perfect alignment. The degree of alignment will be determined by the accuracy required on the finished part. A machine may be lined up sufficiently to produce holes within tolerance when grinding with a straight wheel, but if the wheel is turned and dressed to a taper, the alignment problem is magnified to such an extent that it may be impossible to produce holes within the same tolerance.

The center lines of the wheel, work and diamond must be in a common plane so that the wheel contacts the work at line "*a*". If the tapered wheel contacts the work above or below line "a" the wheel will touch only at its

largest diameter and, as the wheel reverses (at the left end of the hole), it will transfer its taper to the work resulting in a tight hole at the back. Turning the workhead or changing the length of traverse cannot overcome this error. Further, because of poor contact, wheel wear will be excessive and finish poor.

If the diamond is set either above or below line "b" (which is a continuation of "a") the wheel will be dressed to a curve (hyperbola) and even if the wheel contacts the work at-line "a" it will be only a point contact. Again, the wheel form will be transferred to the work at the point of reversal, wheel wear will be excessive and finish poor. The proper setup calls for the work axis, wheel axis and diamond to be in a plane parallel to the longitudinal and cross motion of the machine.


Left end of workhead may be raised or lowered to bring its axis into a plane parallel with wheelslide bar.
Rear of wheelslide may be adjusted to insure straight line motion of the wheel.

The Bryant 1109 Precision Internal Grinder is a semiautomatic machine, designed especially for grinding small bores. Although intended primarily for bore diameters of less than 1", it has a chuck swing of 9" and a maximum grinding stroke of 3½". By using preloaded bar slides for both cross and longitudinal slide movements, sensitivity is obtained without loss of rigidity. These rigid slides transmit the operating load directly to the base of the machine. The Bryant Hi-Frequency Wheelhead, providing speeds up to 100,000 R.P.M., is furnished as standard equipment to assure efficient surface speeds on the wheels necessary for griding small bores. Write for further information.

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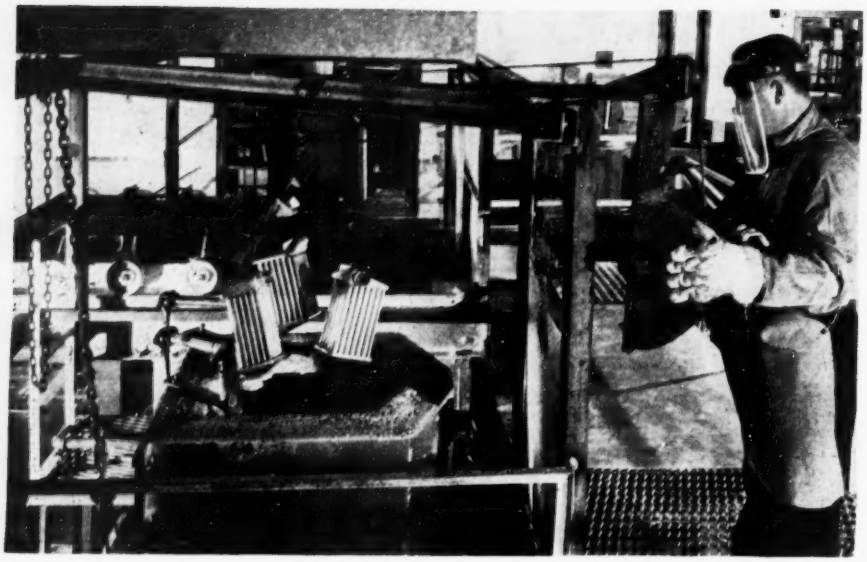


Heat exchangers for GM's Detroit Diesel Engine Division are dipped in molten aluminum at Harrision Radiator using Aldip process

Part II

Use the right process for Coating Steel With Aluminum

Hot dipping is used to produce aluminum-coated steel sheet. New techniques are expanding hot dip coating of fabricated parts. Interest grows in cladding steel with aluminum

ALTHOUGH cladding of steel sheets with aluminum has been practiced in Germany for more than two decades, solid-phase bonding of aluminum alloys to steel was not seriously investigated in this country until recently. This work had as its major objective the solid-phase welding of aluminum to steel. Results are of interest to the roll cladding of sheets because they demonstrate the importance of surface pretreatment, pressure, and heat treatment.

Required bonding temperature seems to be an inverse function of pressure. As an example, in hot pressing aluminum alloy 32S to AISI 303 steel, same bonding strength (25,000 psi) can be attained by using a pressure of 10,000 psi at 850° F, 20,000 psi at 750° F, or 30,000 psi at 650° F. Tests have shown that strength of bonded assemblies of aluminum and steel can be doubled by subsequent annealing.

Low Carbon Type — Cladding processes based on sealed-assembly rolling are extensively used in German plants. Production of aluminum-clad, low-carbon, deep-drawing sheets in Germany is estimated to average about 500 tons per month. In the cladding process, aluminum strip is cold rolled down to 0.008 inch and, after an annealing treatment, is coiled on special reels mounted on a bonding roll stand above and below the steel strip.

As a preliminary treatment, the steel surface is roughened by revolving wire brushes. Sandwiched between two aluminum strips, the steel strip is then rolled on bonding mill under high tension at a temperature of 210 to 390° F. This temperature is produced by the work performed during rolling and not by separate heating. The rolls are approximately 8 inches in diameter and the rolling speed is about 50 fpm.

Tension Coiled — Upon leaving the bonding mill, clad strip is coiled under tension, rerolled on a conventional mill to desired thickness, and given a carefully controlled anneal. The annealing cycle is generally 10 to 15 hours. Temperature ranges from 995 to 1020° F. However, specific temperature is maintained within ±10° F. Aluminum clad steel is used in applications where severe corrosion is encountered.

Casting Around Parts—A meth-

Adapted from Aluminum in Iron and Steel, by Samuel L. Case and Kent R. Van Horn, just published by John Wiley & Sons Inc., New York

od for integrally joining aluminum alloys to steel in parts that require the best combination of high strength, heat transfer, electrical conductivity, and corrosion resistance is the Al-Fin process.

Originally, the process was developed for manufacture of aluminum-finned cylinder barrels for aircraft engines, but its use has expanded to include plane exhaust heat exchangers, composite gears, etc. Process consists essentially of casting aluminum, against a specially - prepared ferrous - alloy surface which is precoated with aluminum. It combines the advantages of high-temperature corrosion resistance and high thermal conductivity of aluminum with the structural strength of the ferrous alloy.

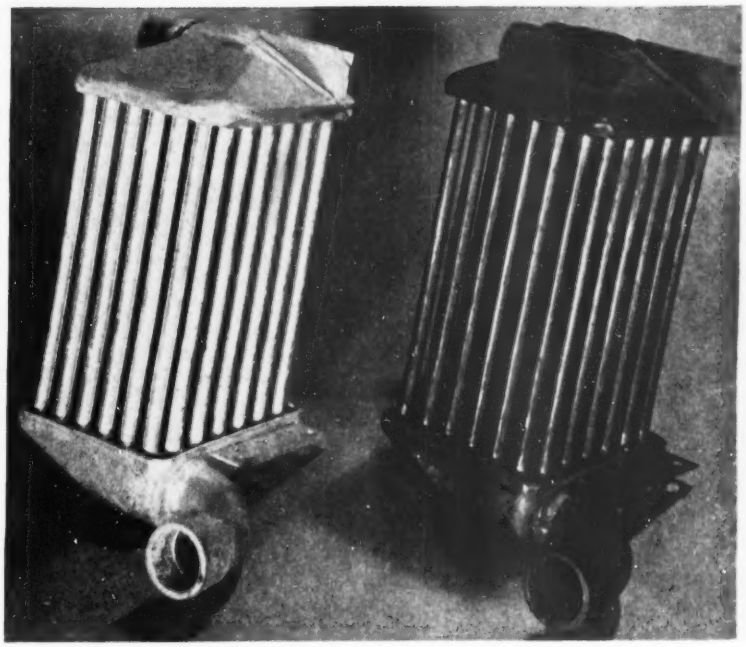
Heat Dissipated—As an example, in the aircraft-engine field, rate at which heat must be dissipated to maintain suitable temperatures in mechanical parts of the engine, such as valves, pistons, and cylinders, becomes a problem of paramount importance. High thermal conductivity of aluminum makes it desirable for this application when it is backed with steel.

In manufacture of Al-Fin cylinder barrels, the aluminum muffs are cast on a steel barrel in permanent molds and then machined on an automatic fin-cutting machine. Because of the efficient bond between aluminum fins and the steel barrel, the difference in expansion characteristics of steel base and aluminum muffs is minimized. Ductile aluminum expands and contracts with the more rigid steel, the bond being strong enough to hold the two metals together.

Fatigue tests conducted on Al-Fin-treated aircraft cylinders show no adverse effect of the treatment on fatigue strength of steel base.

Bearings — Steel-backed aluminum bearings also permit a wide flexibility of design and improved performance. Advantages: 1. Superior corrosion resistance. 2. Low coefficient of friction. 3. Lining is one solid composition, with no plated layers to wear off. 4. High load-carrying capacity. 5. Excellent fatigue properties.

In addition to the Al-Fin process there are other ways of arriving at the same end product. Two patents for such methods have been granted recently: One covers a method of applying an aluminum coating to the ferrous alloy before casting the aluminum; other covers the use of a zinc-aluminum alloy for coating steel prior to casting aluminum.



Aluminum flows through the many tubes, coating both inside and outside surfaces evenly. Heat exchanger is seen before coating (right) and after (left)

Hot-Dip Coating—For commercial coating of steel sheets, strip or fabricated parts, hot-dipping has certain advantages.

Essential requirements for hot-dipping are careful preparation of the steel surface and prevention of formation of oxide films on surface of the molten bath. Procedures employed to accomplish these objectives are the subject of many investigations and patents.

One Way—In the Alplate process, pickled, cleaned and dried steel wire or strip is passed through a hydrogen-atmosphere furnace at 1650 to 1830° F, and then into aluminum bath maintained at a temperature of 1300 to 1400° F. Pretreatment of steel in the hydrogen furnace serves a dual purpose: It imparts a bright clean surface to the steel, and prepacks the steel with hydrogen which improves the bond between base metal and aluminum coating. Since the wire enters the aluminum bath at a temperature higher than the bath temperature, necessary contact time is appreciably shortened, and thickness of the interfacial layer of iron-aluminum compound is kept at a minimum.

Aluminum-coated steel louvers for combustion chamber of an oil heater

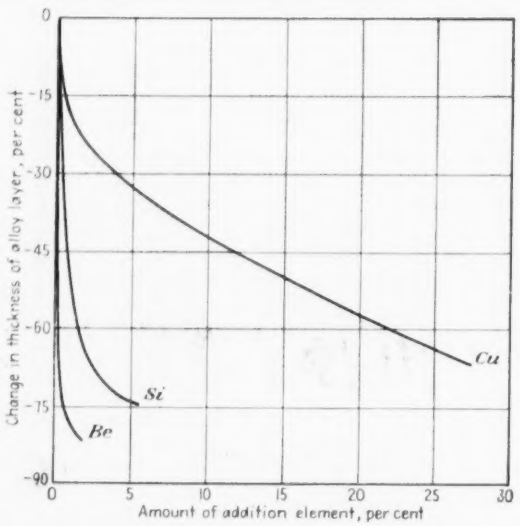
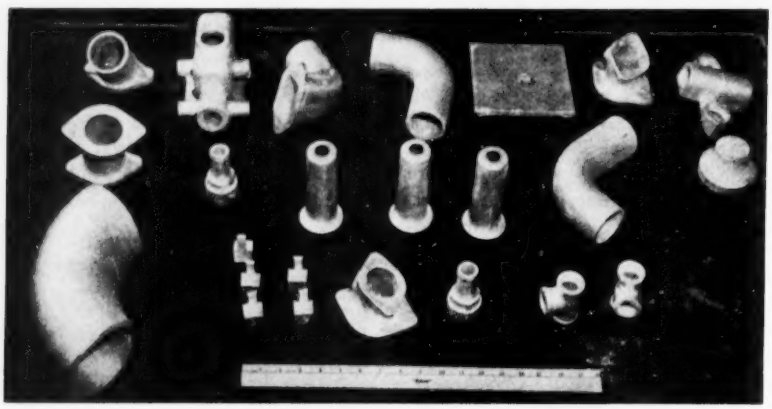


Fig. 1—Effect of copper, silicon and beryllium additions on thickness of the alloy layer produced in aluminum coating by hot dip method



Ferrous parts coated with aluminum by the Aldip method. Parts are dipped in molten salt at 1400 F for 4 minutes, then in molten aluminum for 1 minute. Final step is molten salt rinse given all parts. Air blast removes all drips

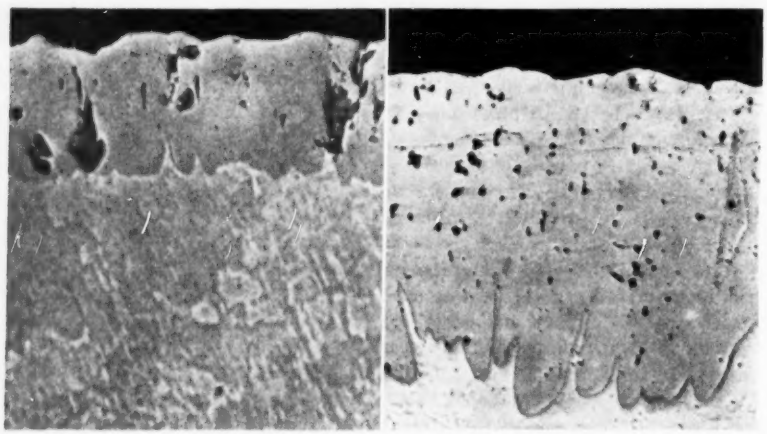


Fig. 2—Left: Structure of hot dip coating after 15-minute anneal at 1400 F. Coating is converted to iron-aluminum compound. Right: Steel dipped into aluminum at 1650 F also gives complete conversion to the iron-aluminum compound

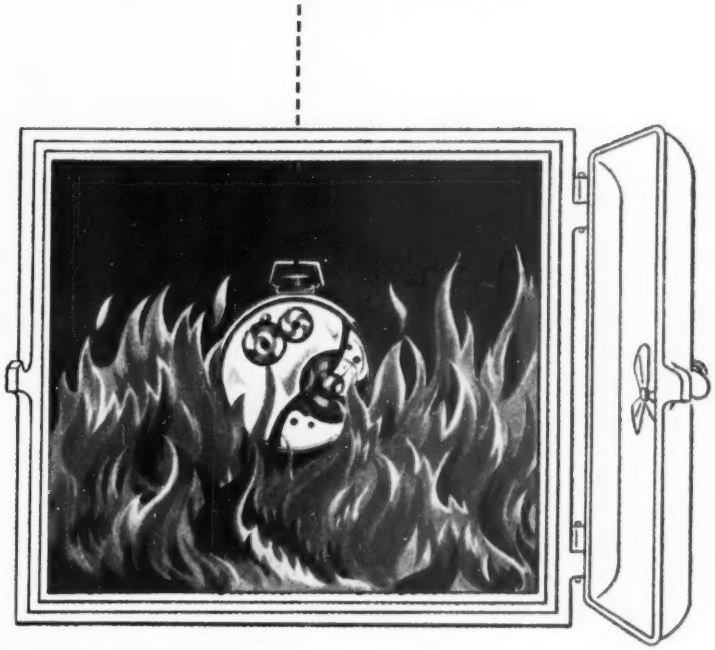
Another process, developed by Armco Steel Corp., involves oxidation of steel and subsequent reduction of oxide film by using a suitably-controlled furnace atmosphere before the metal enters the aluminum bath.

Flux Used—Other hot-dip processes use a molten flux instead of a controlled atmosphere. One such practice employs two electric furnaces. First furnace contains molten flux, while in the second furnace the molten aluminum floats on a bath of electrically heated fused salt. Another patented process covers a method of using a molten-salt treatment prior to dipping in molten aluminum.

In another process, hot-dip coatings are obtained by first spray aluminizing the article, then following with a hot-dip treatment. Work must be immersed in the bath sufficiently long to dissolve the sprayed coating for good adhesion. This method may be useful for intermittent operations but is not economical for the continuous coating of sheets, strip, or wire.

Compound Layers — Microstructure of a hot-dip coating reveals presence of a surface layer of pure aluminum and an interfacial zone of one or more iron-aluminum compounds. Thickness of the interfacial alloy layer depends on temperature of aluminum bath and on immersion time. It may also be strongly affected by alloying additions to the aluminum bath. Effect of bath temperature on thickness of iron-aluminum alloy layer is illustrated in Fig. 2 which shows complete disappearance of the surface layer of pure aluminum when the bath temperature is raised to 1650° F. Entire coating has been converted to an iron-aluminum phase.

Three elements, copper, silicon and beryllium have a marked effect on thickness of the iron-aluminum layer obtained in hot-dip coating of steel. Additions of beryllium to the aluminum bath produce the greatest decrease in thickness of the iron-aluminum layer; 0.1 per cent beryllium reduces alloy layer about 50 per cent. Raising quantity of beryllium to 0.6 per cent decreases the thickness of the alloy zone another 30 per cent. However, further in-



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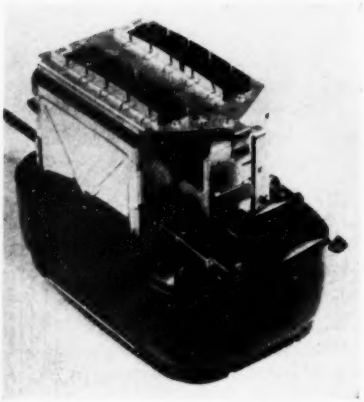
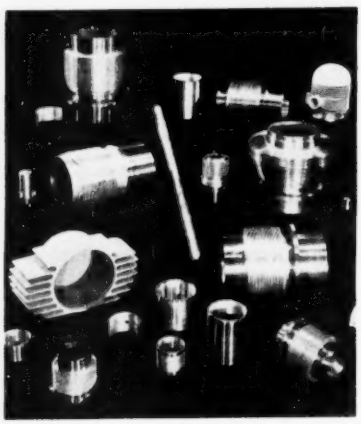


Inside of electric toaster shows parts made from Armco Aluminized steel

creases in the beryllium additions up to 2 per cent have no measurable effect.

Effects of increasing beryllium content on thickness of alloy layer and on appearance of interface between alloy layer and steel base are illustrated in Fig. 1. Addition of 0.75 per cent silicon to aluminum bath reduces thickness of the alloy layer by about 40 per cent; at 2.25 per cent silicon, alloy zone is decreased almost 70 per cent.

Although copper additions influence the interfacial alloy layer, copper content of the bath must be high to be effective. About 15 per cent copper reduces the thickness of alloy layer by about 50 per cent. However, copper additions interfere with adherence of the aluminum coating.



Aircraft engine parts made by the Al-Fin method. Aluminum is cast around a ferrous base, specially prepared

THE AMERICAN STORY

CHAPTER TWELVE

How to make a "STAINLESS REPUTATION"

For high-production manufacturers of automobiles, aircraft, appliances . . . and of chemical, medical, electrical, railroad and building equipment . . . American makes a line of *stainless steel* machine, tapping, thread-cutting and wood screws. Other types are available (and more will be added) . . . all made to American standards of quality and precision, all underwritten by American's engineering-research service. If *you* need standard or special stainless fasteners in quantity, *ask American first* . . . and see why this name is one of the brightest in this important new field of the fastener industry. Write:

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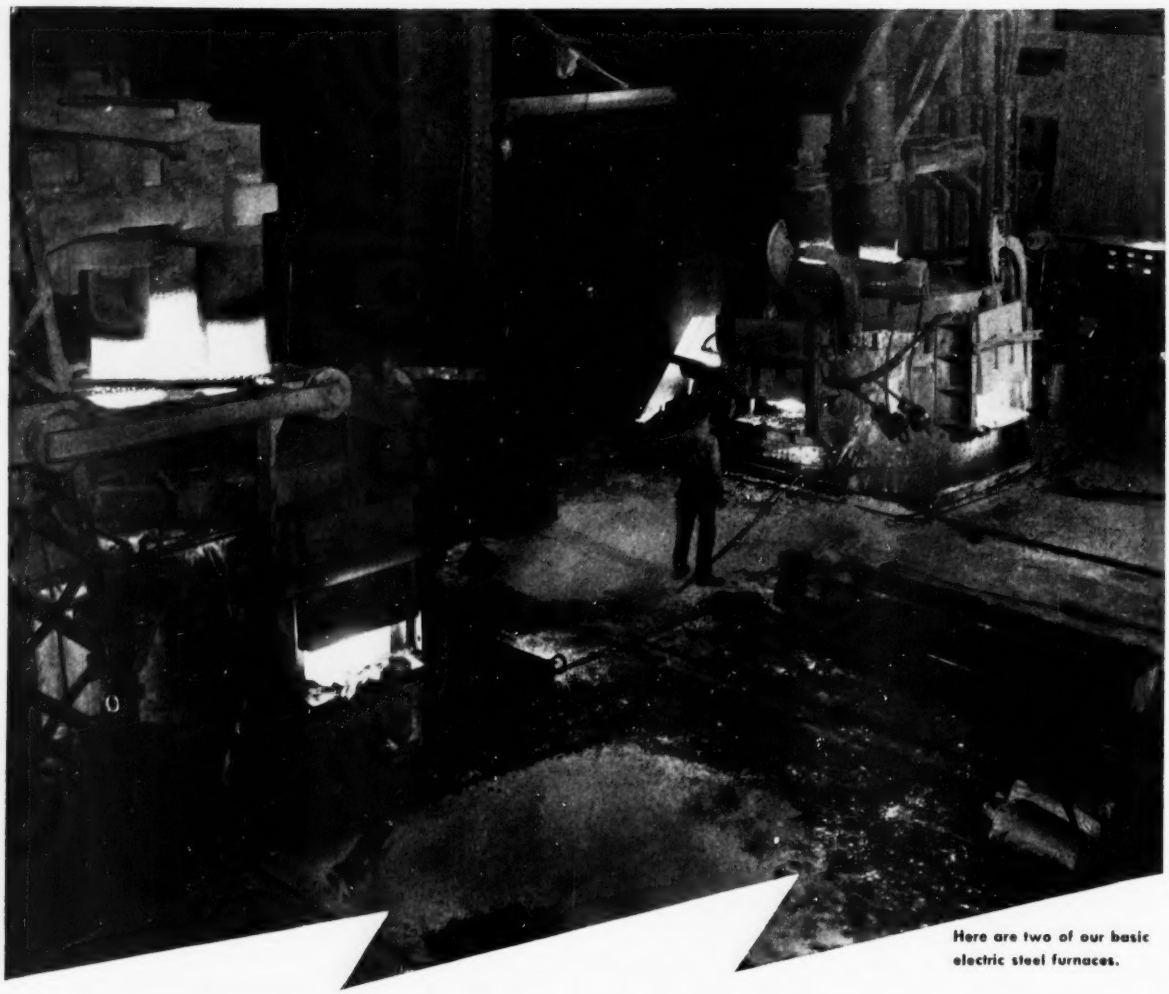

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New Life for Trolleys

ONE of the jobs at the streetcar maintenance shop of the Capital Transit Co., Washington, D. C., is the repair of streetcar body bolsters. This part is a casting which forms the control part of the truck carrying half the car weight.

Center of the bolster is a female bearing surface which accepts the kingpin from the car frame on which the trucks turn when rounding curves. A stub shaft at each end of the bolster forms a bearing providing gimbal action for the truck on rough track bed.

Worn and Flattened—The bolster shafts had become worn and flattened at the bottom causing a bumpy ride and accelerated wear on the related parts. Shafts are turned to true round, the surface is prepared for metallizing and is then sprayed with three pounds of hard steel to ⅛ inch over the original 4 inch diameter. Shafts are then finish ground to required dimensions.

Metallizing Engineering Co.

METAL BOLSTERS CAR BOLSTERS . . . good for another 400,000 miles

Entire job takes approximately three hours for two shafts. It is estimated by the shop supervisor that the company saves $41.51 on each bolster and that they metallize on an average of 12 per week. Metallized shafts will last on the average of 300,000 to 400,000 miles before they have to be re-metallized. This company also metallizes other worn streetcar and bus parts.

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It's easy to select hex head cap screws when you know that *one type,* which costs very little more than the general run, has all the desirable qualities recommended by metallurgists and engineers. Cleveland High Carbon Heat Treated Cap Screws made by the Kaufman Process—the *Double Extrusion* method—"come through" with all the important points experts look for in correctly made fasteners.

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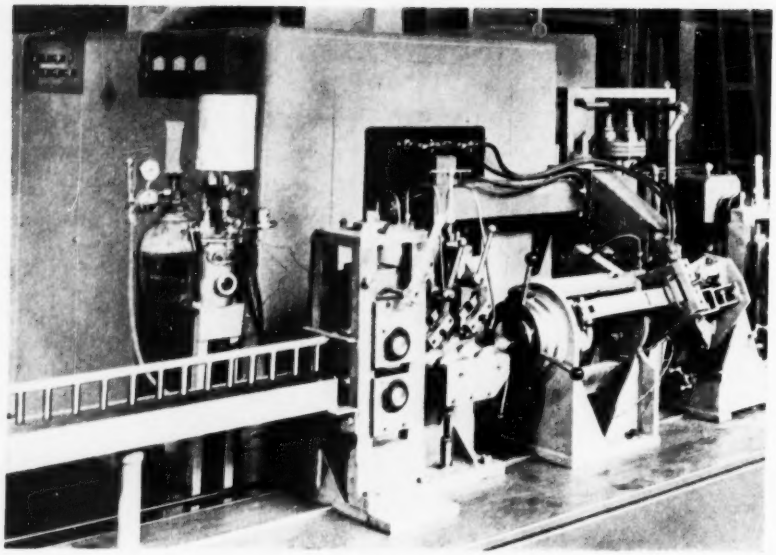


Cold-formed tube passes through short inductor coil, operating around 450 kc. Heat is confined to the thin surface layer at edges about to be joined

Nonferrous Tubing Smashes Speed Barrier

With kinks out of forming, induction welding makes light gages cheaply for first time and at rates up to 120 fpm. Economy expected to influence product design

INDUCTION WELDING of nonferrous tubing is being done at speeds ranging from 40 to 120 fpm. These fabrication rates, 10 to 30 times swifter than other welding methods, elevate nonferrous tubing to the class of its steel counterpart, where the practical maximum is about 150 fpm.

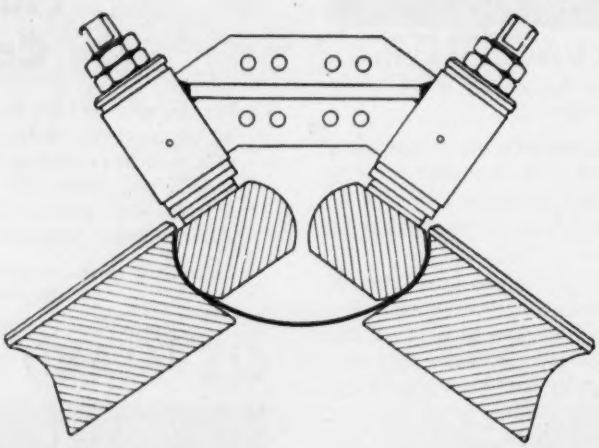
No less important facet of induction welding is this: For the first time, thin-walled aluminum and other nonferrous tubing can be made cheaply. This economy is expected to yield a substantial influence on product design. A large vacuum cleaner manufacturer already is considering aluminum tubing for machine handles.

Thin Heat—Outstanding feature of the process, developed by Yoder Co., Cleveland, is that heat is confined to a thin surface layer at the edges about to be joined. This means most of the physical properties acquired through cold working the metal strip are retained in the finished tube.

Weld zones in tubes made from different grades of aluminum, nickel and other metals show a uniformly narrow weld zone, with a grain structure almost unaffected by heat. In fact, tensile strength of metal in the weld zone is about 15 per cent higher than the strip from which tubes were made.

Here's How — Cold-formed tube is passed through a short inductor coil, which operates around 450 kc. Speed, of course, depends upon kind of metal, gage and diameter of tube. Gages run from 0.025 to 0.134 inch, diameters from ¾ to 8 inches.

Current travels around the surface of the tube in the region of the inductor, then flows along the converging edges of the unwelded tube, to and from a nearby point of convergence. This point is substantially beyond the field of induction and close to the center line



Focal point of cold-forming is four-roll idler cluster. Exerting inward and outward pressure, the rolls prevent springback and are capable of forming walls as thin as 1 per cent of diameter

of a set of rolls which press the seam edges together.

As current approaches the point of convergence of the edges, it is confined to a shallow layer on the surface of the two abutting edges. Practically all current passes between the edges at the point of initial contact, where the weld is made. Little or no shunting current passes across the seam beyond this point, since this would require the current to traverse a path of much higher impedance.

Theory—Skin, proximity and reactance effects are predominant at the frequency employed. Narrow heat-affected weld zones produced evidence higher temperature gradients from the weld interface into the adjoining metal.

Welds are characterized by short time-at-temperature. It is possible to touch the weld in aluminum tubing with bare hands less than one second after it is made.

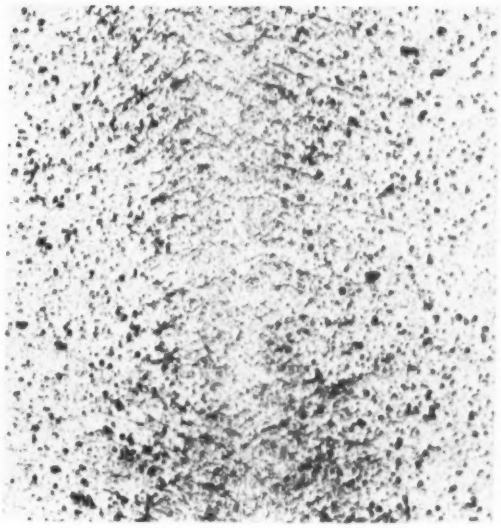
Because the high-temperature surface layer is extremely thin and confined to the edges of the tube, heat contained in the molten surface layer instantly spreads by conduction into the adjacent tube metal.

Weldable Metals — Process will handle almost the entire range of aluminum alloys available in coiled sheet form, certain magnesium alloys, a wide range of brasses and other copper alloys, nickel and nickel alloys, including monel and inconel, austenitic and ferritic stainless steels and lighter gages of carbon steels. Percentage of carbon in the latter is less critical than in electric resistance and hot process welding.

Partly because of its high electrical conductivity and absence of a plastic welding range, welding pure copper by the induction process is not commercially practical. Limited results have been obtained experimentally.

Vapor flux can be used at point of welding for copper alloys and carbon steels, but no gas or flux is needed for aluminum.

Competition—In addition to weld strengths equal to or greater than the bare metal, the continuous process offers substantial cost advantages in light gages over other methods, including extrusion.



End section through weld zone of 14-SO aluminum is magnified 100 times. Uniform narrow zone has a grain structure that is virtually unaffected by heat of the welder

Practical limit for wall thicknesses of an extruded aluminum alloy tube had been about 0.050 inch. On the other hand, steel tubing is cold-formed and electric-welded in gages down to 0.020 inch, with a 2 per cent ratio of wall thickness to tube diameter. The induction process reduces minimum practical wall thickness to 0.025 inch, with a diameter to thickness ratio of about 1 per cent.

Small sizes can be produced economically by drawing down from a larger size. Fractional-inch sizes have been drawn down from 1-inch welded aluminum tubing.

Heat Treatment—Finished tube retains the physical properties acquired by previous cold rolling. Heat treatment isn't necessary.

Cold work aluminum alloys, such as B-50S, 52S and A-54S, can be welded by induction. Without heat treatment, these alloys have a yield strength equal to or considerably higher than the heat treatable alloys, such as 63S, which is generally used in the extrusion of tubing for irrigation and other purposes.

Applications — Process, in addition to making tubing for conventional applications, is highly suited for producing aluminum cable sheathing. Cable and strip can be

Weld zone tensile strength is about 15 per cent higher than bare metal. Test samples (left to right): 70-30 brass, aluminum, nickel, carbon steel, aluminum

Entry end of continuous tube mill at Bridgeport Brass is similar to one purchased by Kaiser Aluminum. Joined strips are formed into tubes, then welded, flash trimmed, cooled, sized and straightened, and sawed to complete the job

fed simultaneously into the mill, and tube is continuously formed around the cable while passing through the forming machine at high speeds.

Once welded, the tube becomes a sheath which is rolled down tightly to the cable in the sizing mill. Welding heat does not damage the paper-wrapped cable, yet a permanent water and gas-tight weld is obtained.

Sheathing in a wide range of sizes is applicable for telephone, power, bridge and aerial cables. For many purposes, it takes the place of lead.

Research—Induction process was perfected after several years of intensive research. The first two tube mills were recently completed by Yoder, and several more are on order and being built.

In the past, nonferrous tubing has been made chiefly by hot processes, which involve extrusion or piercing and drawing. A limited amount of tubing has been produced by cold forming and heliarc welding at rather slow speeds.

Hot processes were employed because the abrupt melting point of most nonferrous metals precluded welding at economical speeds.

Problems — In forming light gages, greatest obstacle was the tendency of tube blanks to wrinkle and buckle at the edges. Edge buckling in light gages was diagnosed as column failure, which was confined to the edge portions of the tube blank. This is due to residual compression.

Compression, in turn, was found to be the result of longitudinal stretching of the edges in the early forming passes. Such failures, for a given size and gage of tube, were aggravated with increase in yield strength and decrease in the modulus of elasticity.

Other Obstacles—Forming problem was further complicated by the need for a roll setup affording the greatest flexibility. Many different materials were to be formed with yield points ranging from 4000 to 75,000 psi or higher, and moduli of elasticity on the order of 10 to 30 million.

In addition, desirability of reaching the higher thickness-diameter ratio involved forming gages ranging from 1 to 10 per cent of diameter. Thin gages presented the greatest problem.

Edge Stretch—Control of edge stretch was accomplished by: 1. Adjustable lower as well as upper roll spindles; 2. Employment of generous roll diameters; 3. Using two triple-roll idler clusters for making the critical vertical transition from the last breakdown pass into the first fin pass of the forming mill; 4. A new method of edge forming; 5. Determining best spacing between successive roll passes.

Adjustable lower spindles for nonferrous mills are needed because of the physical properties of these metals and the extremely high ratio of wall thickness to diameter.

Buckling—Since buckling is a column failure condition of prewelded edges, it was first thought that modified edge forming in the first pass (to set a definite radius to the areas of the strip next to the edges) would improve column strength.

However, the conventional way of doing this did not give the desired results. Great springback of most light-gage, nonferrous materials makes it virtually impossible to form the flat strip to desired small radius curve in marginal areas. Another serious objection was that the top roll had to be changed for every substantial variation in stock thickness.

New Method — Completely new method of edge forming was devised to fill all requirements. It involved using single-radius forming in all breakdown passes and doing the edge-forming in a cluster consisting of four idler rolls. This takes place after the strip is first bent longitudinally to a shallow U-shape in the first two or three driven passes.

The four-roll cluster operates at different angles. And unlike conventional idler rolls, it does actual forming by applying pressure from both sides of the metal in the marginal areas of the strip.

Design has the advantage of being readily adjustable to a greater or smaller arc across the strip width, and for accommodating a wider range of gages with one single set of small rolls.

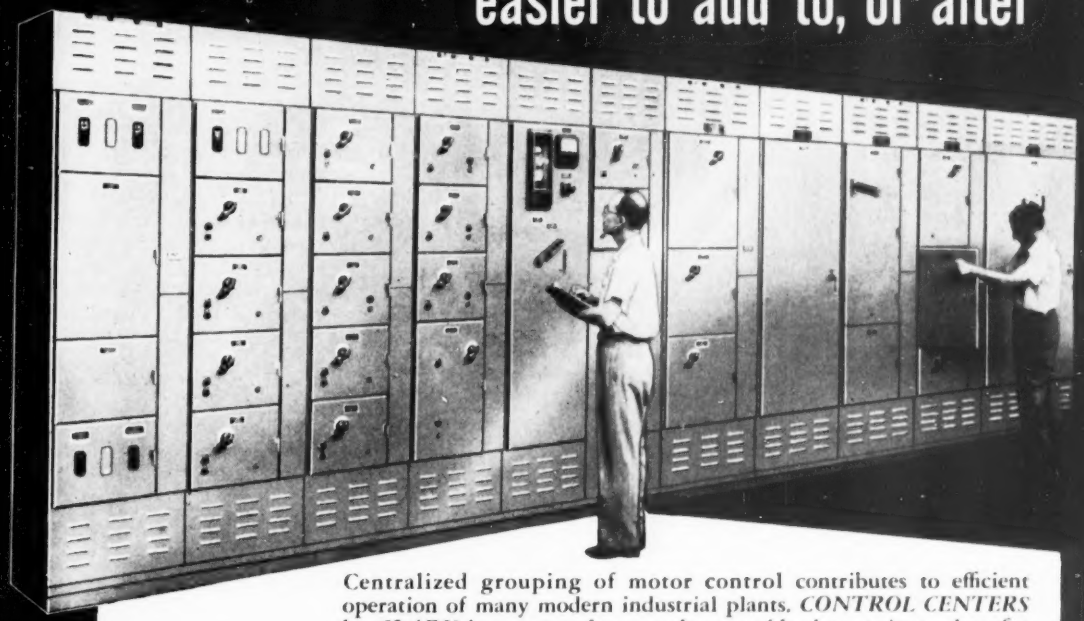
Wire Braid Air Hose

A heavy duty air hose suitable for working pressures up to 400 psi is announced by B. F. Goodrich Co. Hose is reinforced with a single braid of high tensile steel wire and is said to be more flexible than other types of heavy duty air hose.

According to the company, this line of air hose is designed for rugged service in mines, quarries, construction projects and general industrial use where high working pressures are required or where the hose cover is subjected to severe abrasion.

CLARK CONTROL CENTERS

are *easier to install* easier to service easier to add to, or alter



Centralized grouping of motor control contributes to efficient operation of many modern industrial plants. *CONTROL CENTERS* by *CLARK* have many features that provide the maximum benefits obtainable. For example:

Separately enclosed 6-inch wide vertical wireways for each vertical section are accessible without opening compartment doors. This feature means easier installation and maintenance.

Safe-edge compartment doors eliminate dangerous sharp edges and corners. Door handles are interlocked with disconnect switches or circuit breakers.

Frame is rigidly constructed in double-box style, of sturdy welded channel sections, capable of withstanding heavy blows without destroying alignment.

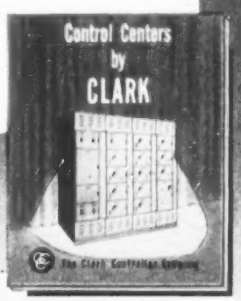
All Control Equipment is accessible and removable from front. Connections and wiring are all done from the front, and all equipment is accessible without removal from compartment.

Each compartment is an integral unit, independent from frame and, in practically all sizes, is completely removable, with plug-in connections. This provides maximum flexibility.

Uniform neat appearance of compartments, in a complete range of sizes, permits an almost infinite variety of combinations.

In NEMA Type C construction, Clark Control Centers permit terminals to be located in top and/or bottom or in vertical wireways.

The use of standard factory-assembled components throughout eliminates special engineering, saves time and money in installations.



CONTROL CENTERS by CLARK, are completely CLARK designed, CLARK engineered and CLARK built, for continuing reliability and uniformity.

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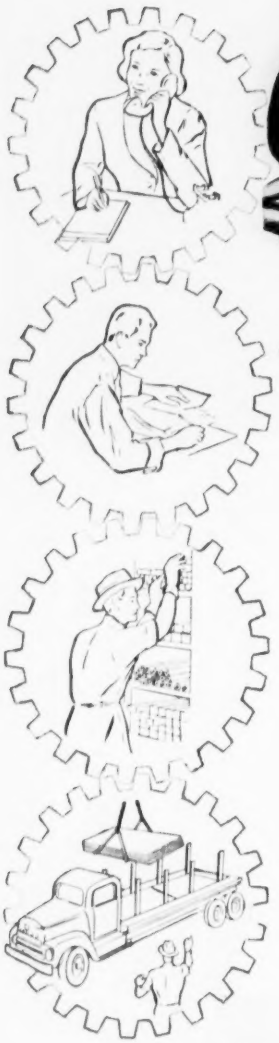

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New Books

Tubemaking Procedure

TUBE MILL PRACTICE, cloth, 194 pages, 8¼ x 11¼ inches; published by the Association of Iron & Steel Engineers, Pittsburgh, for $2.00 for members and $4.00 for nonmembers.

Here is a compilation of articles taken from the *Iron and Steel Engineer* during the last decade which should be of value to the operator and engineer directly associated with tubular products division of the steel industry.

The 23 articles deal with such phases as seamless tubemaking, continuous seamless mills, the piercing process and tension sizing; electric weld tube mills, making electric resistance welded tubing and electric fusion welded pipe; continuous butt-weld pipe manufacture; new tube extrusion process and latest developments in metal extrusion; and such subsidiary steps in tubemaking as high-speed heating of rounds, large rotary furnace design, bar and tube straightening, centerless turning of bars, billets and tubes, and stocking and shipping pipe.

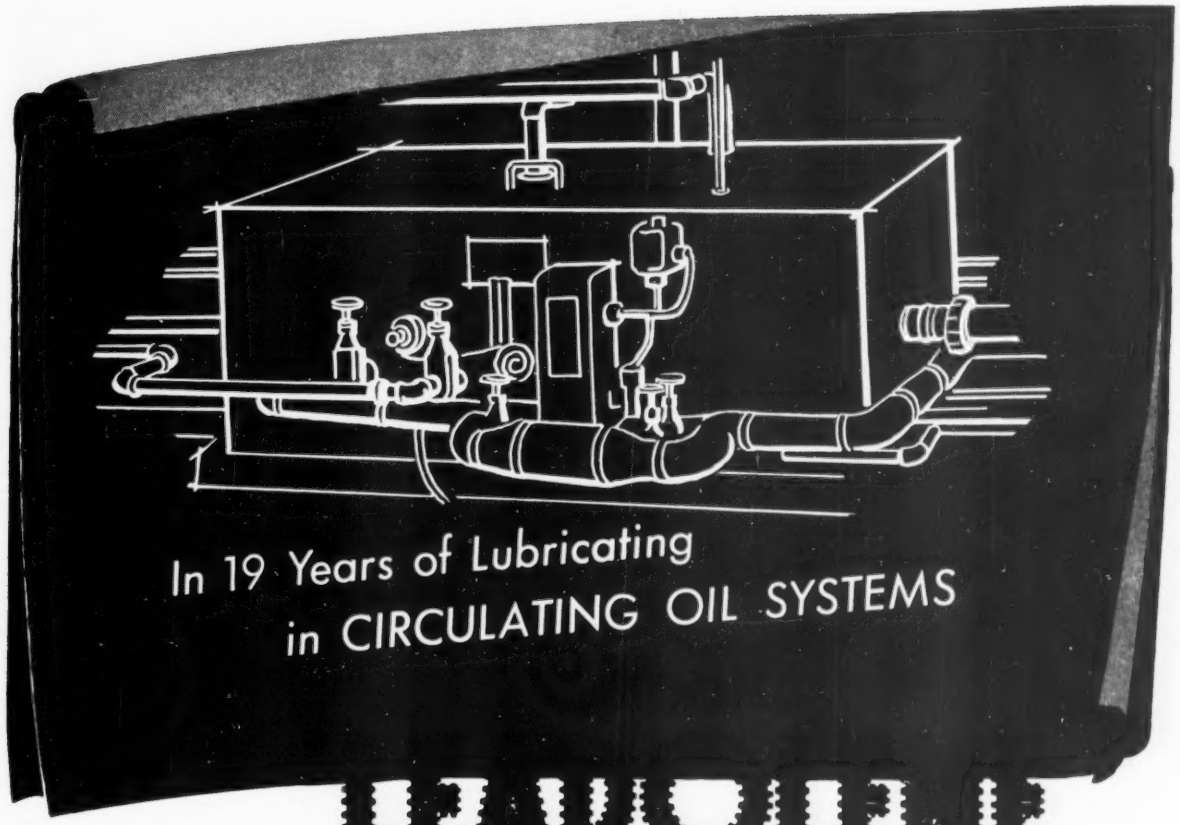
While the articles contain much operating information themselves, their value is enhanced by discussions of superintendents, chief engineers, development and construction engineers, directors of research, fuel engineers and works managers.

The treatise serves either as a primer for the layman, to acquaint him with the pipe and tubemaking processes, or as a work to which the skilled operator will refer time and again in the course of his duties.

Labor and Small Business

SUCCESSFUL LABOR RELATIONS FOR SMALL BUSINESS, by James Menzies Black and J. George Piccoli; cloth, 425 pages, 6¼ x 9¼ inches; published by McGraw-Hill Book Co., Inc., New York, for $6; available from STEEL, Penton Bldg., Cleveland.

Threatened by a strike? Negotiating your first contract with a union? Confronted by an organizational drive in your plant? This book gives practical advice on what to do about those and many other common labor relations problems. It's aimed at businesses employing less than 500 persons and is based on the author's experiences in the Associated Industries of Cleveland, which gives labor relations counsel and service to its more than 600 members. You will find this book a down-to-earth and useful treatise on one of management's most perplexing problems.



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STEEL
August 10, 1953

Market Outlook

THE automotive industry, watched closely for clues as to the size of future steel demand, is beginning to pare down its orders for steel. The cutbacks are yet spotty and small in number but they are noteworthy because they are the first to emerge in recent times. How much they mean is yet to be seen.

BELLWETHER—Because the automotive industry is the largest consumer of steel (it uses one-fifth of all the steel) many analysts believe that as the auto industry goes so goes the steel industry. For many months the over-all demand for steel has exceeded supply. While progress toward a balance between demand and supply has been made through some declines in demand and an increase in steel production capacity, the day of plenty of steel for everyone would arrive quickly if there were heavy cuts in automotive steel consumption.

STILL THERE'S OPTIMISM— Despite some downward readjustment of sights in near-term automobile production, there's still a substantial amount of optimism in the auto industry.

The reductions in automotive demand for steel are appearing as outright cancellations of orders by the automakers for steel and parts and postponement of ordering of steel and parts for the last two months of this year.

SOMETHING NEW—One of the cancellations was for 30 per cent of the steel sheet an automaker had on order for fourth-quarter delivery. This cancellation is the first sizable one the steel producer has received for a long time. Although consumers have been having difficulty getting all the sheets they want, this automaker accumulated sizable inventories of that product while trimming car production to fit demand.

WATCH THIS—Another area to watch for signs of a shrinkage in steel demand is that of subcontractors in the metalworking industry. With the decline in locomotive production one builder of locomotives is cutting off subcontractors and assuming the manufacture of parts. In the first quarter of next year, this builder expects to need as much or more steel from mills as it has been taking, although fewer locomotives will be built. Similarly, other fields may drop subcontractors. Thus, steel mills may feel a first easing in demand from a lot of small users rather than a few big ones.

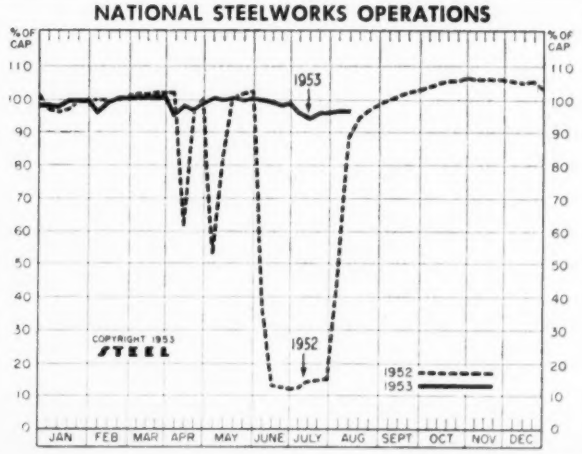
BECOMING THE BOSS—Easing of pressure for steel also includes a growing selectiveness on the part of buyers, particularly warehouses, the suppliers of steel to small consumers. Many warehouses are placing the bulk of their fourth-quarter orders on sizes and grades wanted. No longer will they accept just what is offered. This indicates the balance in their inventories is improved and that mill shipments are arriving closer to schedule.

Nevertheless, over-all steel demand is strong.

TIGHT SPOTS—On some products, steel producers will not be able to make third-quarter delivery on all orders booked for shipment for that period. In some instances the order carryover will amount to two to four weeks of output.

In response to the substantial demand for steel, mills continue to produce steel for ingots and castings at a pace of a little more than 2 million net tons a week, and in the week ended Aug. 8 the national ingot rate held unchanged at 96.5 per cent of capacity.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged at leading production points)

	Week Ended Aug. 8	Change	Same Week 1952	Same Week 1951
Pittsburgh	95.5	0*	85	98.5
Chicago	102	+ 12*	90	104.5
Mid-Atlantic	96.5	— 1	80	100.5
Youngstown	106	+ 1	90	106
Wheeling	99.5	+ 0.5	63.5	98
Cleveland	104.5	+ 2.5*	99	104
Buffalo	106.5	0	106.5	104
Birmingham	95.5	— 4.5	87	100
New England	90	+ 1	75	92
Cincinnati	88.5	— 2	43	101
St. Louis	103	+ 10	99	90.5
Detroit	106	+ 4	108	98.5
Western	101	— 6.5	78	103
Estimated National Rate	96.5	0	89	102

* Change from preceding week's revised rate.

Weekly steelmaking capacity is estimated at 2,254,459 net tons in 1953; 2,077,040 tons in 1952; 1,999,034 tons in 1951.

The Metalworking Outlook—p. 45 Technical Outlook—p. 95

Composite Market Averages

FINISHED STEEL PRICE INDEX: Bureau of Labor Statistics	Aug. 4 1953	July 28 1953	Month Ago	July Average
(1947-1949=100)	141.7	141.7	141.6	141.7

AVERAGE PRICES (BUREAU OF LABOR STATISTICS)
Week Ended Aug. 4, 1953

Units are 100 lb except where otherwise noted.

Rails, standard No. 1	$4.400	Sheets, electrical grade	$9.183
Rails, light, 40 lb	5.767	Strip, C.R. carbon	7.371
Plates, carbon	4.550	Strip, C.R. stainless, 430, (lb)	0.415
Structural Shapes	4.383	Strip, H.R. carbon	5.113
Bars, tool steel (lb)	1.730	Pipe, black, buttweld (100 ft)	14.454
Bars, H.R. alloy	8.675	Pipe, galv., buttweld (100 ft)	17.895
Bars, H.R. stainless, 303, (lb)	0.418	Casing, oil well, carbon (100 ft)	149.516
Bars, H.R. carbon	4.850	Tin Plate, hot-dipped, 1.25 lb.	8.433
Bars, reinforcing	4.775	Tin Plate, electrolytic, 0.25 lb.	7.133
Bars, C.F. carbon	7.860	Black Plate, can making	6.233
Bars, C.F. alloy	11.075	Wire, carbon, 8 gage	7.713
Sheets, H.R. carbon	4.765	Wire, stainless, 430, (lb)	0.542
Sheets, C.R. carbon	5.904	Bale Ties (bundle)	5.653
Sheets, galvanized	7.015	Nails, wire, 8d common	7.530
Sheets, C.R. stainless, 302, (lb)	0.548	Wire, barbed (80 rod spool)	6.847
		Woven Wire Fence (20 rod roll)	16.174

FINISHED STEEL PRICE INDEX, Weighted: Calculated by STEEL*	Aug. 6 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	189.38	189.38	189.18	181.40	143.08
Index in cents per lb.	5.130	5.130	5.125	4.914	3.876

ARITHMETICAL PRICE COMPOSITES: Calculated by STEEL*					
Finished Steel NT	$115.56	$115.56	$114.84	$111.66	$95.05
No. 2 Fdry. Pig Iron, GT	56.54	56.54	56.54	55.04	44.30
Basic Pig Iron, GT	56.04	56.04	56.04	54.66	43.86
Malleable Pig Iron, GT	57.27	57.27	57.27	55.77	44.68
Steelmaking Scrap, GT	44.08	44.08†	43.17	43.00	43.33

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130. †Revised.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS	Aug. 6 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.95	3.45
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., del. Philadelphia	5.302	5.302	5.302	4.502	3.79
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.85	3.25
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, del., Philadelphia	4.38	4.38	4.38	4.13	3.48
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.50
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.35	3.75
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.55	4.55	4.55	4.35	3.95
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.275
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Detroit, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheet, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	3.975-4.425	3.975-4.425	3.975-4.425	3.75-4.00	3.275
Strip, H.R., Chicago	3.925	3.925	3.925	3.725	3.275
Strip, C.R., Pittsburgh	5.45-5.95	5.45-5.95	5.45-5.95	5.10-5.80	4.00
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.125
Strip, C.R., Detroit	5.45-6.05	5.45-6.05	5.45-6.05	5.30-6.05	4.20
Wire, Basic, Pitts.	5.475-5.525	5.475-5.525	5.475-5.525	5.10-5.225	4.15
Nails, Wire Pittsburgh	6.35-6.55	6.35-6.55	6.35-6.55	5.90-6.35	5.15
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$6.70
SEMIFINISHED					
Billets, forging, Pitts.(NT)	$75.50	$75.50	$75.50	$70.50	$61.00
Wire rods, 5/32-3/8", Pitts.	4.525	4.525	4.525	4.325	3.45
PIG IRON, Gross Ton					
Bessemer, Pitts.	$57.00	$57.00	$57.00	$55.00	$47.00
Basic, Valley	56.00	56.00	56.00	54.50	43.00
Basic, del. Phila.	60.75	60.75	60.75	59.25	46.17
No. 2 Fdry., Pitts.	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry., Chicago	56.50	56.50	56.50	55.00	43.25
No. 2 Fdry., Valley	56.50	56.50	56.50	55.00	43.50
No. 2 Fdry., del. Phila.	61.25	61.25	61.25	59.75	46.67
No. 2 Fdry., Birm.	52.88	52.88	52.88	51.38	43.38
No. 2 Fdry (Birm.) del. Cin.	60.43	60.43	60.43	58.93	49.09
Malleable, Valley	56.50	56.50	56.50	55.00	43.50
Malleable, Chicago	56.50	56.50	56.50	55.00	43.50
Ferromanganese, Etna, Pa.	200.00†	200.00†	200.00†	228.00*	148.00*

*78-82% Mn., per gross ton. †74-76% Mn, per net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$44.50	$44.50	$44.50	$44.00	$42.75
No. 1 Heavy Melt, E. Pa.	44.25	44.25	43.5	41.50	45.50
No. 1 Heavy Melt, Chicago	43.50	43.50	41.50	42.50	41.75
No. 1 Heavy Melt, Valley	45.50	45.50	45.50	44.00	42.75
No. 1 Heavy Melt, Cleve.	45.50	45.50	43.50	43.00	42.25
No. 1 Heavy Melt, Buffalo	43.75	43.75	40.75	43.00	46.25
Rails, Rerolling, Chicago	56.00	55.50	54.00	52.50	63.25
No. 1 Cast, Chicago	42.00	41.00	41.00	50.00	70.00

COKE, Net Ton

Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$14.25
Beehive, Fdry, Connlsvl.	16.75	16.75	16.75	17.00	17.00
Oven Fdry, Chicago	24.50	24.50	24.50	23.00	20.40

PIG IRON

F.o.b. furnace prices as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies on page 159.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$58.00	$58.50	$59.00	$59.50
New York, del.	....	62.28	62.78	....
Newark, del.	61.02	61.52	62.02	62.52
Philadelphia, del.	60.75	61.25	61.75	62.25
Birmingham District				
AlabamaCity,Ala. R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	....	....
Woodward,Ala. W15	52.38	52.88	....	....
Cincinnati, del.	....	60.43	....	....
Buffalo District				
Buffalo R2	56.00	56.50	57.00	....
Buffalo H1	56.00	56.50	57.00	....
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No. Tonawanda,N.Y. T9	....	56.50	57.00	....
Boston, del.	66.65	67.15	67.65	....
Rochester,N.Y., del.	59.02	59.52	60.02	....
Syracuse,N.Y., del.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14	56.00	56.50	56.50	....
So.Chicago,Ill. Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, del.	58.17	58.67	58.67	59.17
Muskegon,Mich., del.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron,O., del. from Cleve.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Duluth I-3	....	....	56.50	....
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	....	63.25	63.75	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	57.50	58.00	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
Lone Star,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T3	....	....	58.50	....
Pittsburgh District				
NevilleIsland,Pa. P6	56.00	56.50	56.50	....
Pitts.,N.&S. sides, Ambridge, Aliquippa, del.	57.37	57.87	57.87	....
McKeesRocks, del.	57.04	57.54	57.54	....
Lawrenceville, Homestead, Wilmerding, Monaca, del.	57.66	58.16	58.16	....
Verona, Trafford, del.	58.19	58.69	58.69	....
Brackenridge, del.	58.45	58.95	58.95	....
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....
Monessen,Pa. P7	56.00	....	....	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	60.00	60.50	61.00	61.50
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, del.	61.76	62.26	....	....
Troy, N. Y. R2	58.00	58.50	59.00	....
Youngstown District				
Hubbard,O. Y1	....	....	56.50	....
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., del.	60.90	....	61.40	61.90

*Low phos, southern grade

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson,O. G2, J1	$67.00
Buffalo H1	68.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

Niagara Falls,N.Y. P15	$91.00
Keokuk,Iowa, Openhearth & Fdry, freight allowed K2	95.50
Keokuk, OH & Fdry, 12½ lb piglets, 16% Si, frt. allowed K2	98.50
Wenatchee,Wash., OH & Fdry, freight allowed K2	95.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$61.00
Rockwood,Tenn. T3	68.50
Steelton,Pa. B2	64.00
Philadelphia, delivered	67.55
Troy,N.Y. R2	64.00

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NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary & Secondary Metals

Copper: Electrolytic 28.50-30.00c, Conn. Valley; Lake 30.125c; foreign electrolytic, deld., 28.50-30.00c.

Brass Ingots: 85-5-5-5 (No. 115) 24.50c; 88-10-2 (No. 215) 34.00c; 80-10-10 (No. 305) 28.50c; No. 1 yellow (No. 405) 20.75c.

Zinc: Prime western 11.00c; brass special 11.25c; intermediate 11.50c; East St. Louis. Prime western 11.25-11.50c, brass special 11.50-11.75c, intermediate 11.75-12.00c, high grade 12.25-12.50c, special high grade 12.50-13.00c, delivered.

Lead: Common 13.80c; chemical 13.90c; corroding 13.90c; St. Louis.

Primary Aluminum: 99% plus, ingots 21.50c; pigs 20.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 22.50-23.00c; No. 12 foundry alloy (No. 2 grade) 21.75-22.25c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.75-24.00c; grade 2, 22.70-23.00c; grade 3, 21.50-22.00c; grade 4, 20.00-21.00c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 27.00c, f.o.b. Freeport, Tex.

Tin: Straits, 78.50c, New York.

Antimony: American 99-99.8% and over but not meeting specifications below 34.50c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 35.00c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes 99.9%, base sizes at refinery, unpacked, 60.00c; 25-lb pigs 62.65c; "XX" nickel shot, 62.65c; "F" nickel shot or ingots, for addition to cast iron, 60.00c. Prices include import duty.

Mercury: Open market, spot, New York, $191-$194 per 76-lb flask.

Cadmium: "Regular" straight or flat forms, $2 deld.; special or patented shapes $2.15.

Beryllium-Copper: 3.75-4.25% Be, $10.00 per lb of contained beryllium, with balance as copper at market price on date of shipment, f.o.b. Reading, Pa., or Elmore, O.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open-market, New York 85.25c per oz.

Platinum: $91-$93 per ounce from refineries.

Palladium: $23-$24 per troy ounce.

Iridium: $165-$175 per troy ounce.

Titanium: (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Cents per pound, f.o.b. mill, effective Apr. 1, 1953. Listings are lowest quotations.)

Sheet: Copper 50.48; yellow brass 42.87; commercial bronze, 95% 49.89; 90% 48.76; red brass, 85% 47.11; 80% 45.99; best quality, 44.43; nickel silver, 18%, 59.84; phosphor-bronze grade A, 5%, 70.50.

Rod: Copper, hot-rolled 46.83; cold-drawn 48.08; yellow brass free cutting, 36.68; commercial bronze 95% 49.58; 90% 48.45; red brass 85%, 46.80; 80%, 45.68.

Seamless Tubing: Copper 50.42; yellow brass 45.78; commercial bronze, 90%, 51.32; red brass, 85%, 49.62.

Wire: Yellow brass 43.16; commercial bronze, 95%, 50.18; 90%, 49.05; red brass, 85%, 47.40; 80%, 46.28; best quality brass, 44.72.

(Base prices effective July 11, 1953)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb. lots, 35.39; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb, 36.25; 30,000 lb, 36.55; l.c.l., 37.03. Magnet wire deld., 15,000 lb or more 41.83; l.c.l., 42.58.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders. Effective July 20, 1953.)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	33.9	...	...
0.135-0.096	12-48	34.4	...	...
0.095-0.077	12-48	35.1	32.7	37.5
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.038	12-48	36.6	33.6	38.4
0.037-0.030	12-48	37.0	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.8
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.3	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.6	44.6	54.1
0.006	12-18	50.2	46.0	59.1

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	—Round— 11S-T3	17S-T4	—Hexagonal— 11S-T3	17S-T4
Drawn				
0.125	59.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $19.00 per cwt; add 50c per cwt for 100 sq ft to 140 sq ft. Pipe: Full coils $19.00 per cwt. Traps and bends: List prices plus 30%.

ZINC

Sheets 23.00c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50c f.o.b. mill, 36,000 lb and over. Plates, 20.75-21.75c.

"A" NICKEL

(Base prices f.o.b. mill effective Mar. 9, 1953) Sheets, cold-rolled 86.50c. Strip, cold-rolled 92.50c. Rods and shapes, 82.50c. Plates, 84.50c. Seamless tubes 115.50c.

MONEL

(Base prices f.o.b. mill effective July 1, 1953) Sheets, cold-rolled 67.50c. Strip, cold-rolled 70.50c. Rods and shapes, 65.50c. Plates 66.50c. Seamless tubes, 100.50c. Shot and blocks, 60.00c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter less than 25 lb 58.00c-65.00c; 25 to 99 lb, 48.00c-55.00c; 100 lb to 5000 lb, 44.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 47.14c; oval 46.64c.

Nickel Anodes: Rolled, oval, carbonized, carloads 81.00c; 5000 to 29,999 lb, 83.00c; 500 to 4999 lb, 85.00c; 1 to 499 lb, 89.00c, f.o.b. Cleveland.

Nickel Chloride: In 100 lb bags; 10,000 lb and over, 37.00c; 5000 to 9900 lb, 38.00c; 400 to 4900 lb, 40.00c; 300 lb, 42.00c; 200 lb, 43.00c; 100 lb, 45.00c, f.o.b. Cleveland.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers 64.4c per lb; 100 to 350 lb drums only, 100 to 600 lb 59.5c; 700 to 1900 lb, 48c; 2000 to 9900 lb, 46.2c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers. Based on 79-cent tin.

Tin Anodes: Bar, 1000 lb and over, 95c; 500 to 999 lb, 95.5c; 200 to 499 lb 96c; less than 200 lb, 97.5c. Freight allowed east of Mississippi and north of Ohio and Potomac. Based on 79-cent tin.

Stannous Sulphate: 100 lb kegs or 400 lb bbl less than 2000 lb 86.8c; more than 2000 lb, 84.8c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers. Based on 79-cent tin.

Stannous Chloride (Anhydrous): In 400 lb bbl, 97c; 100 lb kegs 99.4c, f.o.b. Carteret, N. J., freight allowed on 100 lb or more. Based on 79-cent tin.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c; f.o.b. Niagara Falls, N. Y.

Scrap Metals

Brass Mill Allowances

(Prices in cents per pound for less than 20,000 pounds, f.o.b. shipping point; on lots over 20,000 pounds at one time of any or all kinds of scrap, add 1 cent per pound.)

	Clean Heavy	Rod Ends	Clean Turnings
Copper	28.625	28.625	27.875
Yellow Brass	21.375	21.125	19.625
Commercial Bronze			
95%	27.250	27.000	26.500
90%	26.125	25.875	25.375
Red Brass			
85%	25.125	24.875	24.375
80%	24.125	23.875	23.375
Best Quality (71-80%)	22.500	22.250	21.750
Muntz metal	20.000	19.750	19.250
Nickel silver, 10%	25.250	25.000	12.625
Phos. Bronze, A	30.625	30.375	29.375
Naval Brass	20.000	19.750	19.250
Manganese Bronze	20.000	19.750	19.250

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 21.50; No. 2 copper 20.00; light copper 18.50; refinery brass (60% copper) per dry copper content 18.00-18.50.

INGOT MAKERS' COPPER AND BRASS SCRAP BUYING PRICES

(Cents per pound, carlots, delivered)

No. 1 copper 21.50; No. 2 copper 20.00; light copper 18.50; No. 1 composition borings 15.50-16.00; No. 1 composition solids 16.50-17.00; radiators 13.00; heavy yellow brass solids, 14.00; yellow brass turnings 13.00.

SMELTERS' BUYING PRICES FOR SCRAP ALUMINUM

(Carlots, delivered)

2S aluminum clippings, 15.00-15.50c; mixed clipping, 14.00-14.50c; old aluminum sheet, 12.50-13.50c; old aluminum cast, 12.50-13.50c; borings and turnings, 13.00-13.75c.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 20.00; No. 2 copper 18.00; light copper 16.00; No. 1 composition red brass 15.00; No. 1 composition turnings 14.50; mixed brass turnings 8.50; new brass clippings nom.; No. 1 brass rod turnings nom.; light brass 9.00; heavy yellow brass 11.00; new brass rod ends nom.; auto radiators, unsweated 11.00; cocks and faucets 13.00; brass pipe 14.50.

Aluminum: Clippings 2s 13.00; old sheets 9.00; crankcase 9.00; borings and turnings 6.50; pistons and struts 6.50.

Tin: No. 1 pewter 37.00-45.00; block tin pipe 60.00-65.00; No. 1 babbitt 35.00-40.00.

Lead: Heavy 11.00-11.50; battery plate 6.25-6.50; linotype and stereotype 13.25; electrotype 11.50; mixed babbitt 12.00-12.50.

Zinc: Old zinc, 4.50; new die cast scrap, 4.50; old die cast scrap, 3.50.

Nickel: Sheets and clips $1.00; rolled anodes $1.00; turnings 85.00c; rod ends $1.00.

Monel: Clippings 33.00; old sheet 30.00; turnings 25.00; rods 33.00.

DAILY PRICE RECORD

1953	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Aug. 5-6	28.50-30.00	13.80	11.00	78.50	21.50	34.50	60.00	85.25
Aug. 4	28.50-30.00	13.80	11.00	78.25	21.50	34.50	60.00	85.25
Aug. 1-3	29.00-30.00	13.80	11.00	78.25	21.50	34.50	60.00	85.25
July 31	29.00-30.00	13.80	11.00	78.25	21.50	34.50	60.00	85.25
July 30	29.00-30.00	13.80	11.00	78.50	21.50	34.50	60.00	85.25
July 29	29.75-30.00	13.80	11.00	79.75	21.50	34.50	60.00	85.25
July 28	29.75-30.00	13.80	11.00	79.25	21.50	34.50	60.00	85.25
July 27	29.75-30.00	13.80	11.00	78.75	21.50	34.50	60.00	85.25
July 24-25	29.75-30.00	13.80	11.00	80.25	21.50	34.50	60.00	85.25
July 23	29.75-30.00	13.80	11.00	79.75	20.50-21.50	34.50	60.00	85.25
July 22	29.75-30.00	13.55	11.00	78.75	20.50-21.50	34.50	60.00	85.25
July 21	29.75-30.00	13.55	11.00	78.25	20.50-21.50	34.50	60.00	85.25
July 20	29.75-30.00	13.55	11.00	79.75	20.50-21.50	34.50	60.00	85.25
July 17-18	29.75-30.00	13.30	11.00	80.75	20.50-21.50	34.50	60.00	85.25
July Avg.	29.346	13.483	11.00	81.577	20.923	34.50	60.00	85.25

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9% base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Nonferrous Metals

With copper prices on the skids, consumers prefer price on date of shipment to a flat price. Companion metals also feel effect of copper's slump

SLUMPING COPPER still dominates the market. Price is fluid and falling.

Center of attention for both buyers and sellers, copper is taking its long-expected tumble. Until price realignment is complete—and that time is anybody's guess—market men will be engrossed in following the red metal's market fortunes. Companion metals are feeling the effect too, as orders are withheld until the copper market reorganizes.

The Break—Reopening of private trading on the London Metal Exchange took a lot of the price prognosticators by surprise. The first session last Wednesday found copper selling almost two cents below most prior estimates.

The British government has been selling copper to consumers for 31.5 cents a pound. Trading opened at the equivalent of 26.88 for prompt delivery and 25.00 for 3-month delivery. At the close it had sunk to 26.25 cents for prompt and 24.50 for November metal. Freight and insurance charge of about 1 cent must be added to these quotations to determine delivered price to Connecticut valley consumers.

Futures Down—The commodity exchange in this country also was affected. December copper can be had at less than 24 cents and delivery next June below 23 cents, though a 1.35-cent freight charge must be added to get a realistic equivalent delivery.

Resistance by domestic producers to tag along behind the London market is evident. U. S. companies will wait for the dust to settle before making drastic cuts, and might even try to support the London price by entering bids themselves. Custom smelters, always the first to cut prices, caused some stir by reducing copper to 28.50 cents before London trading even began. It was the second reduction in a week, the first being from 29.75 to 29.00 cents. Consumers aren't much interested, and at present prefer price on date of shipment to a flat price.

Nickel: More Freedom Near

Restrictions on end-use of nickel may be revoked Oct. 1. Timetable suggested by the Steel Industry Advisory Committee seems to be that used by NPA. It recommended decontrol of alloys other than nickel by the beginning of the third quarter, ending allocations of nickel by Oct. 1 and revocation of M-80 by Dec. 31. The first has been accomplished, the second is well on its way and the third may be accelerated one quarter. Many patterns are being discussed for relaxation of the restrictions, either by percentages or by segments, but industry men think it must be across the board or not at all. Platers are now allowed to use 40 per cent of base for allowable plating and 25 per cent for flash plating, the former representing an improvement of 15 points in three months.

When decontrol does come, suppliers say there will be no damaging drain on stocks from the demand spurt, but that all people won't get what they want when they want it for a while.

Secondary nickel products could be pointing the way for primary nickel marketwise. Nickel-containing scrap has loosened quite a bit in recent weeks. Monel scrap is almost a drug on the market and Inconel scrap is free and easy. Nickel clips, quoted at $1.00 by dealers, have reportedly been offered at a 55 to 65-cent range, with no takers.

Brass Rod Imports Are Hurting

Imports of free cutting brass rod are slicing deeply into domestic mills' order books. Price concessions of 6 to 8 cents are reported in New England and a delivered quotation of 28 cents a pound is common in the New York-New Jersey area. U. S. brass mills quote 36.68 cents for free cutting rod, and can offer delivery from stock on popular standard sizes, while importers have a six-weeks' backlog.

Deliveries of brass mill products have narrowed a bit, with sheet and strip available in about eight weeks, tube in four to six weeks, and wire in two to four weeks. Brass mills will benefit competitively from any drop in copper price; fabricators expected reduced brass prices before this. One reason advanced is that the brass companies that usually initiate price movements both have copper facilities in Chile, and will resist change until that situation is settled.

STEEL's Metal Price Averages for July, 1953

(Cents per pound)

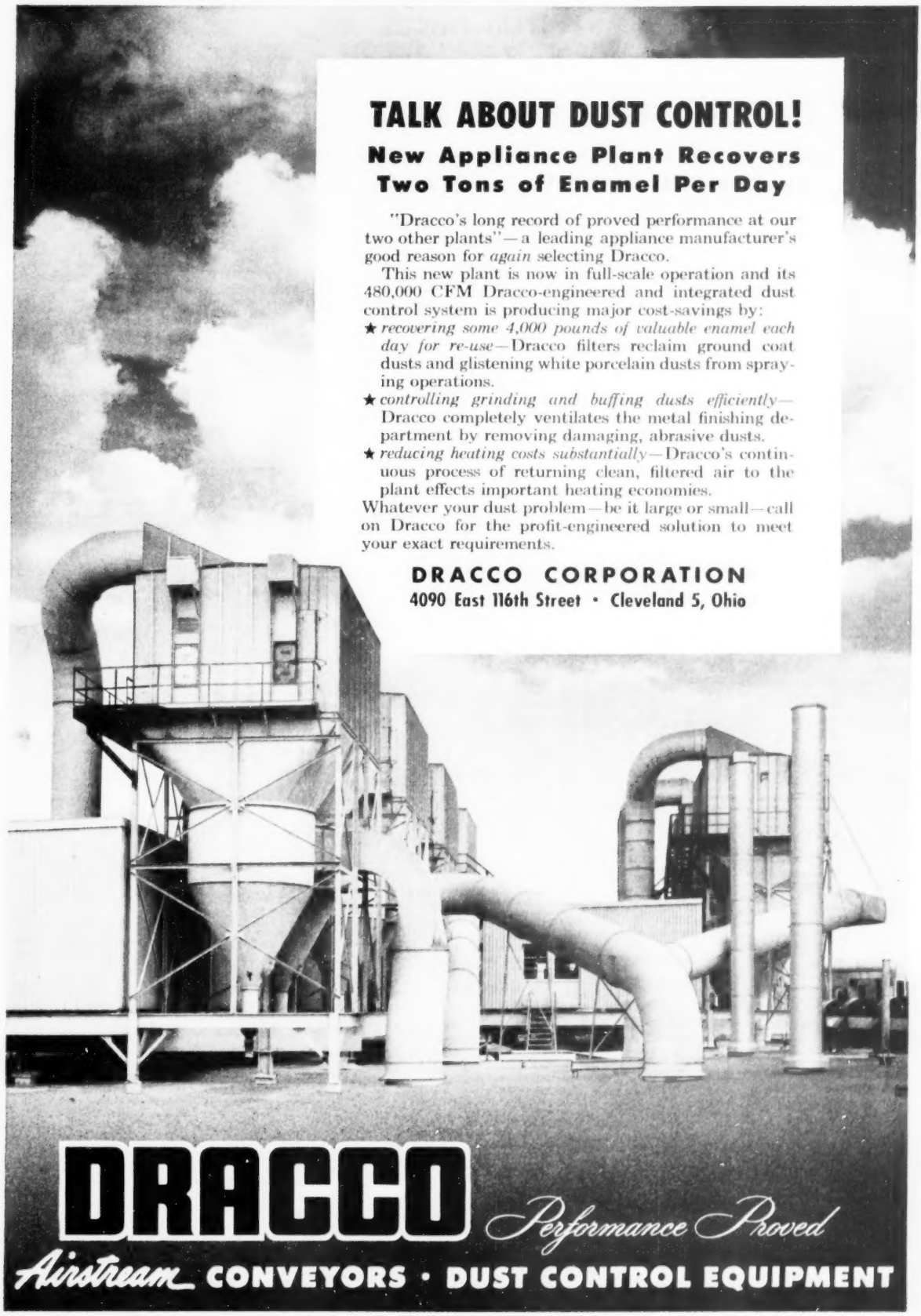
Electrolytic Copper, del. Conn.	29.846
Lead, St. Louis	13.483
Prime Western Zinc, E. St. Louis	11.000
Straits Tin, New York	81.577
Primary Aluminum Ingots, del.	20.923
Antimony, f.o.b. Laredo, Tex.	34.500
Nickel, f.o.b. refinery	60.000
Silver, New York	85.250

Four Prices for Zinc

Zinc market now has four price levels. American Zinc Sales Co. will continue using the E. St. Louis basing system for prime western zinc but will absorb freight in excess of 50 cents per hundredweight. By this move, American Zinc sets a ceiling on freight costs from E. St. Louis, but doesn't intend to follow a delivered price plan, believing that the freight costs would be passed back to the mine, and that mines couldn't bear that extra cross with all the trouble they've had lately. Another reason advanced by the company is that imports will continue under any system and regardless of the U. S. price and can be reduced only by a resumption of demand abroad.

Nonferrous Briefs

- Lead sales are slow at the 14.00-cent price, and are running below July. Offerings of imported lead allow only slight concessions, at which consumers can't justify buying.
- Cartridge brass could move into oversupply as ammunition makers get cut-back orders.
- Tin trading settled down after a frantic July and buying has resumed on a small scale. Straits tin hovers about 78 cents for prompt, and December tin brings about 74 cents, indicating perhaps that the big fluctuations are over.
- Aluminum Import Corp.'s application to be made a party to the antitrust suit against Alcoa indicates confidence on the part of the parent company, Aluminium Ltd., that the contract with Alcoa to supply 600,000 tons of aluminum will hold up.



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"Dracco's long record of proved performance at our two other plants"—a leading appliance manufacturer's good reason for *again* selecting Dracco.

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★ *controlling grinding and buffing dusts efficiently*—Dracco completely ventilates the metal finishing department by removing damaging, abrasive dusts.

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STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on page 159. Key to footnotes, page 161.

—SEMIFINISHED—

INGOTS, Carbon, Forging (NT)

Fontana,Calif. K1	$86.00
Munhall,Pa. U5	59.00

INGOTS Alloy (NT)

Detroit R7	$63.00
Fontana,Calif. K1	88.00
Midland,Pa. C18	62.00
Munhall,Pa. U5	62.00

BILLETS, BLOOMS & SLABS Carbon Rerolling (NT)

Aliquippa,Pa. J5	$62.50
Bessemer,Pa. U5	62.00
Clairton,Pa. U5	62.00
Ensley,Ala. T2	62.00
Fairfield,Ala. T2	62.00
Fontana,Calif. K1	81.00
Gary,Ind. U5	62.00
Johnstown,Pa. B2	62.00
Lackawanna,N.Y. B2	62.00
Munhall,Pa. U5	62.00
So.Chicago,Ill. U5	62.00
So.Duquesne,Pa. U5	62.00

Carbon, Forging (NT)

Aliquippa,Pa. J5	$75.50
Bessemer,Pa. U5	75.50
Buffalo R2	75.50
Canton,O. R2	75.50
Clairton,Pa. U5	75.50
Cleveland R2	75.50
Conshohocken,Pa. A3	82.50
Detroit R7	78.50
Ensley,Ala. T2	75.50
Fairfield,Ala. T2	75.50
Fontana,Calif. K1	94.50
Gary,Ind. U5	75.50
Geneva,Utah C11	75.50
Houston S5	85.50
Johnstown,Pa. B2	75.50
Lackawanna,N.Y. B2	75.50
LosAngeles B3	94.50
Munhall,Pa. U5	75.50
Seattle B3	94.50
So.Chicago R2,U5,W14	75.50
So.Duquesne,Pa. U5	75.50
So.SanFrancisco B3	94.50

Alloy, Forging (NT)

Bethlehem,Pa. B2	$82.00
Buffalo R2	82.00
Canton,O. R2	82.00
Canton,O. T7	84.60
Conshohocken,Pa. A3	89.00
Detroit R7	85.00
Fontana,Calif. K1	101.00
Gary,Ind. U5	82.00
Houston S5	92.00
Ind.Harbor,Ind. Y1	82.00
Johnstown,Pa. B2	82.00
Lackawanna,N.Y. B2	82.00
LosAngeles B3	102.00
Massillon,O. R2	82.00
Midland,Pa. C18	82.00
Munhall,Pa. U5	82.00
So.Chicago R2,U5,W14	82.00
So.Duquesne,Pa. U5	82.00
Struthers,O. Y1	82.00
Warren,O. C17	82.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2	$87.50
Canton,O. R2	92.50
Cleveland R2	92.50
Fontana,Calif. K1	113.50
Gary,Ind. U5	92.50
Massillon,O. R3	92.50
So.Chicago,Ill. R2	92.50
So.Duquesne,Pa. U5	92.50

SHEET BAR (NT)

Fontana,Calif. K1	$93.18

SKELP

Aliquippa,Pa. J5	3.85
Munhall,Pa. U5	3.75
Warren,O. R2	3.75
Youngstown R2, U5	3.75

WIRE RODS

Aliquippa,Pa. J5	4.525
Alton,Ill. L1	4.70
AlabamaCity,Ala. R2	4.525
Buffalo W12	4.525
Cleveland A7	4.525
Donora,Pa. A7	4.525
Fairfield,Ala. T2	4.525
Fontana,Calif. K1	5.325
Johnstown,Pa. B2	4.525
Houston S5	4.925
Minnequa,Colo. C10	4.775
Monessen,Pa. P7	4.725
Joliet,Ill. A7	4.525
KansasCity,Mo. S5	4.865
LosAngeles B3	5.325
No.Tonawanda,N.Y. B11	4.525
Pittsburg,Calif. C11	5.175
Portsmouth,O. P12	4.725
Roebling,N.J. R5	4.425
So.Chicago,Ill. R2	4.525
SparrowsPoint,Md. B2	4.625
Sterling,Ill.(1) N15	4.525
Struthers,O. Y1	4.525
Torrance,Calif. C11	5.325
Worcester,Mass. A7	4.825

—STRUCTURALS—

Carbon Steel Stand. Shapes

AlabamaCity,Ala. R2	4.10
Aliquippa,Pa. J5	4.10
Bethlehem,Pa. B2	4.15
Bessemer,Ala. T2	4.10
Clairton,Pa. U5	4.10
Fairfield,Ala. T2	4.10
Fontana,Calif. K1	4.75
Gary,Ind. U5	4.10
Geneva,Utah C11	4.10
Houston S5	4.60
Ind.Harbor,Ind. I-2	4.10
Johnstown,Pa. B2	4.15
KansasCity,Mo. S5	4.80
Lackawanna,N.Y. B2	4.15
LosAngeles B3	4.80
Minnequa,Colo. C10	4.55
Munhall,Pa. U5	4.10
Niles,Calif.(22) P1	4.91
Phoenixville,Pa. P4	4.95
Seattle B3	4.85
So.Chicago,Ill. U5, W14	4.10
So.SanFrancisco B3	4.75
Torrance,Calif. C11	4.80
Weirton,W.Va. W6	4.35

Wide Flange

Bethlehem,Pa. B2	4.15
Clairton,Pa. U5	5.00
Fontana,Calif. K1	5.30
Lackawanna,N.Y. B2	4.15
Munhall,Pa. U5	4.10
So.Chicago,Ill. U5	4.10

Alloy Stand. Shapes

Clairton,Pa. U5	5.00
Fontana,Calif. K1	6.40
Gary,Ind. U5	5.00
Munhall,Pa. U5	5.00
So.Chicago,Ill. U5	5.00

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5	6.175
Bessemer,Ala. T2	6.175
Bethlehem,Pa. B2	6.20
Clairton,Pa. U5	6.175
Fairfield,Ala. T2	6.175
Fontana,Calif K1	6.825
Gary,Ind. U5	6.175
Geneva,Utah C11	6.175
Ind.Harbor,Ind. I-2	6.175
Ind.Harbor,Ind. Y1	6.675
Johnstown,Pa. B2	6.20
Lackawanna,N.Y. B2	6.20
LosAngeles B3	6.85
Munhall,Pa. U5	6.175
Seattle B3	6.90
So.Chicago,Ill. U5, W14	6.175
So.SanFrancisco B3	6.80
Struthers,O. Y1	6.675

H.S., L.A. Wide Flange

Bethlehem,Pa. B2	6.20
Lackawanna,N.Y. B2	6.20
Munhall,Pa. U5	6.125
So.Chicago,Ill. U5	6.125

BEARING PILES

Munhall,Pa. U5	4.10
So.Chicago,Ill. U5	4.10

—PILING—

STEEL SHEET PILING

Ind.Harbor,Ind. I-2	4.925
Lackawanna,N.Y. B2	4.925
Munhall,Pa. U5	4.925
So.Chicago,Ill. U5	4.925

—PLATES—

PLATES, Carbon Steel

AlabamaCity,Ala. R2	4.10
Aliquippa,Pa. J5	4.10
Ashland,Ky. (15) A10	4.10
Bessemer,Ala. T2	4.10
Clairton,Pa. U5	4.10
Claymont,Del. C22	4.55
Cleveland J5, R2	4.10
Coatesville,Pa. L7	4.35
Conshohocken,Pa. A3	4.55
Ecorse,Mich. G5	4.65
Fairfield,Ala. T2	4.10
Fontana,Calif.(30) K1	4.75
Gary,Ind. U5	4.10
GraniteCity,Ill. G4	4.60
Geneva,Utah C11	4.10
Harrisburg,Pa. C5	4.50
Houston S5	4.60
Ind.Harbor,Ind. I-2, Y1	4.10
Johnstown,Pa. B2	4.10
Lackawanna,N.Y. B2	4.10
Minnequa,Colo. C10	4.95
Munhall,Pa. U5	4.10
Pittsburgh J5	4.10
Riverdale,Ill. A1	4.10
Seattle B3	5.00
Sharon,Pa. S3	4.10
So.Chicago,Ill. U5, W14	4.10
SparrowsPoint,Md. B2	4.10
Steubenville,O. W10	4.10
Warren,O. R2	4.10
Weirton,W.Va. W6	4.40
Youngstown R2, U5, Y1	4.10

PLATES, Carbon A.R.

Fontana,Calif. K1	5.90
Geneva,Utah C11	5.25

PLATES, Wrought Iron

Economy,Pa. B14	9.30

PLATES,High-Strength Low-Alloy

Aliquippa,Pa. J5	6.25
Bessemer,Ala. T2	6.25
Clairton,Pa. U5	6.25
Cleveland R2	5.95
Cleveland J5	6.25
Conshohocken,Pa. A3	6.50
Ecorse,Mich. G5	7.10
Fairfield,Ala. T2	6.25
Fontana,Calif.(30) K1	6.95
Gary,Ind. U5	6.25
Geneva,Utah C11	6.25
Ind.Harbor,Ind. I-2	6.25
Ind.Harbor,Ind. Y1	6.75
Johnstown,Pa. B2	6.25
Lackawanna,N.Y. B2	6.25
Munhall,Pa. U5	6.25
Pittsburgh J5	6.25
Seattle B3	7.15
Sharon,Pa. S3	6.25
So.Chicago,Ill. U5, W14	6.25
SparrowsPoint,Md. B2	6.25
Warren,O. R2	5.95
Youngstown U5	6.25
Youngstown Y1	6.75

PLATES, Alloy

Claymont,Del. C22	5.65
Coatesville,Pa. L7	5.75
Fontana,Calif. K1	6.60
Gary,Ind. U5	5.55
Johnstown,Pa. B2	5.55
Munhall,Pa. U5	5.55
Sharon,Pa. S3	5.70
So.Chicago,Ill. U5, W14	5.55
SparrowsPoint,Md. B2	5.55

FLOOR PLATES

Cleveland J5	5.15
Conshohoken,Pa. A3	5.15
Ind.Harbor,Ind. I-2	5.15
Munhall,Pa. U5	5.15
So.Chicago,Ill. U5	5.15

PLATES, Ingot Iron

Ashland,c.l. (15) A10	4.35
Ashland,l.c.l. (15) A10	4.85
Cleveland, c.l.	4.70
Warren,O. c.l. R2	4.70

—BARS—

BARS, Hot-Rolled Carbon

AlabamaCity,Ala. R2	4.15
Aliquippa,Pa. J5	4.15
Alton,Ill. L1	4.50
Atlanta,Ga. A11	4.45
Bessemer,Ala. T2	4.15
Buffalo R2	4.15
Clairton,Pa. U5	4.15
Cleveland R2	4.15
Detroit R7	4.30
Ecorse,Mich. G5	4.50
Emeryville,Calif. J7	4.90
Fairfield,Ala. T2	4.15
Fontana,Calif. K1	4.85
Gary,Ind. U5	4.15
Houston S5	4.65
Ind.Harbor,Ind. I-2, Y1	4.15
Johnstown,Pa. B2	4.15
KansasCity,Mo. S5	4.85
Lackawanna,N.Y. B2	4.15
LosAngeles B3	4.85
Milton,Pa. B6	4.55
Minnequa,Colo. C10	4.66
Niles,Calif. P1	4.85
N.Tonawanda,N.Y. B11	4.15
Pittsburg,Calif. C11	4.85
Pittsburgh J5	4.15
Portland,Oreg. O4	4.90
Seattle B3, N14	4.90
So.Chicago R2, U5, W14	4.15
So.Duquesne,Pa. U5	4.15
So.SanFran.,Calif. B3	4.90
Sterling,Ill. N15	4.75
Struthers,O. Y1	4.15
Torrance,Calif. C11	4.85
Weirton,W.Va. W6	4.30
Youngstown R2, U5	4.15

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2	4.875
Buffalo R2	4.875
Canton,O. T7	5.02
Canton,O. R2	4.875
Clairton,Pa. U5	4.875
Detroit R7	5.025
Ecorse,Mich. G5	5.225
Fontana,Calif. K1	5.925
Gary,Ind. U5	4.875
Houston S5	5.375
Ind.Harbor,Ind. I-2, Y1	4.875
Johnstown,Pa. B2	4.875
KansasCity,Mo. S5	5.575
Lackawanna,N.Y. B2	4.875
LosAngeles B3	5.925
Massillon,O. R2	4.875
Midland,Pa. C18	4.875
So.Chicago R2, U5,W14	4.875
So.Duquesne,Pa. U5	4.875
Struthers,O. Y1	4.875
Warren,O. C17	4.875
Youngstown U5	4.875

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5	6.225
Bessemer,Ala. T2	6.225
Bethlehem,Pa. B2	6.225
Clairton,Pa. U5	6.225
Cleveland R2	5.925
Ecorse,Mich. G5	6.875
Fairfield,Ala. T2	6.225
Fontana,Calif. K1	7.475
Gary,Ind. U5	6.225
Ind.Harb.,Ind. I-2, Y1	6.225
Johnstown,Pa. B2	6.225
Lackawanna,N.Y. B2	6.225
LosAngeles B3	6.925
Pittsburgh J5	6.225
Seattle B3	6.975
So.Chicago W14	6.225
So.Duquesne,Pa. U5	6.225
So.SanFrancisco B3	6.975
Struthers,O. Y1	6.725
Youngstown U5	6.225

BAR SIZE ANGLES;H.R.CARBON

Bethlehem,Pa. B2	4.35

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5	4.15
Atlanta A11	4.45
Houston S5	5.70
KansasCity S5	5.90
Niles,Calif. P1	4.85
SanFrancisco S7	5.10

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5	5.00
Fontana,Calif. K1	6.00
Gary,Ind. U5	5.00
Youngstown U5	5.00

BARS, Cold-Finished Carbon

Ambridge,Pa. W18	5.20
BeaverFalls,Pa. M12, R2	5.20
Buffalo B5	5.25
Camden,N.J. P13	5.65
Caranegie,Pa. C12	5.20
Chicago W18	5.20
Cleveland A7, C20	5.20
Detroit P17, R7	5.35
Detroit B5	5.40
Donora,Pa. A7	5.20
Elyria,O. W8	5.20
FranklinPark,Ill. N5	5.20
Gary,Ind. R2	5.20
GreenBay,Wis. F7	5.185
Hammond,Ind. L2, M13	5.20
Hartford,Conn. R2	5.75
Harvey,Ill. B5	5.20
LosAngeles R2	6.65
Mansfield,Mass. B5	5.75
Massillon,O. R2, R8	5.20
Monaca,Pa. S17	5.20
Newark,N.J. WT8	5.65
NewCastle,Pa.(17) B4	5.20
Pittsburgh J5	5.20
Plymouth,Mich. P5	5.45
Putnam,Conn. WT8	5.75
Readville,Mass. C14	5.75
St.Louis,Mo. M5	5.50
So.Chicago,Ill. W14	5.20
SpringCity,Pa. K3	5.65
Struthers,O. Y1	5.20
Waukegan,Ill. A7	5.20
Worcester,Mass. W19	6.10
Youngstown F3, Y1	5.20

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19	4.45

BARS, Cold-Finished Alloy

Ambridge,Pa. W18	6.325
Beaver,Falls,Pa. M12	6.325
Bethlehem,Pa. B2	6.325
Buffalo B5	6.325
Camden,N.J. P13	6.50
Canton,O. B2	6.325
Canton,O. T7	6.29
Carnegie,Pa. C12	6.00
Chicago W18	6.325
Cleveland A7, C20	6.325
Detroit P17, R7	6.475
Detroit B5	6.525
Donora,Pa. A7	6.325
Elyria,O. W8	6.325
Gary,Ind. R2	6.325
Hammond,Ind. L2, M13	6.325
Hartford,Conn. R2	6.775
Harvey,Ill. B5	6.325
Lackawanna,N.Y. B2	6.325
Mansfield,Mass. B5	6.775
Massillon,O. R2, R8	6.325
Midland,Pa. C18	6.325
Monaca,Pa. S17	6.325
Newark,N.J. W18	6.65
Plymouth,Mich. P5	6.525
So.Chicago,Ill. R2, W14	6.325
SpringCity,Pa. K3	6.475
Struthers,O. Y1	6.325
Warren,O. C17	6.325
Waukegan,Ill. A7	6.325
Worcester,Mass. A7	6.625
Youngstown F3, Y1	6.325

BARS, Reinforcing (Fabricators)

AlabamaCity,Ala. R2	4.15
Atlanta A11	4.45
Buffalo R2	4.15
Cleveland R2	4.15
Emeryville,Calif. J7	4.90
Fairfield,Ala. T2	4.15
Fontana,Calif. K1	4.85
Gary,Ind. U5	4.15
Houston S5	4.65
Ind.Harbor,Ind. I-2	4.15
Johnstown,Pa. B2	4.15
KansasCity,Mo. S5	4.85
Lackawanna,N.Y. B2	4.15
LosAngeles B3	4.85
Milton,Pa. B6	4.55
Minnequa,Colo. C10	4.75
Niles,Calif. P1	4.85
Pittsburg,Calif. C11	4.85
Pittsburgh J5	4.15
SandSprings,Okla. S5	5.05
Seattle B3, N14	4.90
So.Chicago,Ill. R2	4.15
So.Duquesne,Pa. U5	4.15
So.SanFrancisco B3	4.90
SparrowsPoint,Md. B2	4.15
Sterling,Ill. (1) N15	4.90
Struthers,O. Y1	4.15
Torrance,Calif. C11	4.85
Youngstown R2, U5	4.15

BARS, Reinforcing (Fabricated; to consumers)

Johnstown, ¾-1" B2	5.55
KansasCity S5	6.35
LosAngeles B3	6.18
Marion,O. P11	5.25
Seattle N14	5.80
Seattle B3	6.25
SandSprings S5	6.45
So.SanFrancisco B3	6.25
SparrowsPt. ¾-1" B2	5.55
Williamsport,Pa. S19	5.45

RAIL STEEL BARS

ChicagoHts.(3) C2	4.50
ChicagoHts.(4) C2	4.75
ChicagoHts.(3,4) I-2	4.50
Franklin,Pa.(3) F5	4.50
Franklin,Pa.(4) F5	4.75
FortWorth,Tex.(26) T4	4.65
Marion,O.(3) P11	4.50
Moline,Ill.(3) R2	4.65
Tonawanda(3,4) B12	5.00
Williamsport(3) S19	5.25
Williamsport,Pa.(4) S19	5.45

BARS, Wrought Iron

Economy,Pa.(S.R.) B14	10.40
Economy,Pa.(D.R.)B14	12.90
Economy(Staybolt) B14	13.20
Mck.Rks.(Staybolt) L5	15.50
Mck.Rks.(S.R.) L5	10.40
Mck.Rks.(D.R.) L5	14.00

—SHEETS—

SHEETS, Hot-Rolled Steel (18 gage and heavier)

AlabamaCity,Ala. R2	3.925
Ashland,Ky.(8) A10	3.925
Butler,Pa. A10	3.925
Cleveland J5, R2	3.925
Conshohocken,Pa. A3	4.325
Detroit M1	4.40
Ecorse,Mich. G5	4.125
Fairfield,Ala. T2	3.925
Fairless,Pa. U5	4.025
Fontana,Calif. K1	4.70
Gary,Ind. U5	3.925
Geneva,Utah C11	4.025
GraniteCity,Ill. G4	4.30
Ind.Harbor,Ind. I-2, Y1	3.925
Irvin,Pa. U5	3.925
Lackawanna,N.Y. B2	3.925
Munhall,Pa. U5	3.925

Niles,O. N12 .....5.425
Pittsburg,Calif. C11 ..4.625
Pitsourgh J5 .....3.925
Riverdale,Ill. A1 .....3.925
Sharon, Pa. S3 .....4.225
So.Chicago,Ill. W14 ...3.925
SparrowsPoint,Md B2..3.925
Steubenville,O. W10 ..3.925
Torrance, Calif. C11 ..4.625
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ...3.925
Youngstown U5, Y1 ...3.925

SHEETS, H.R. (19 gage)

AlabamaCity,Ala. R2 ..5.225
Dover,O. R1 .....5.825
Mansfield,O. E6 .....5.80
Niles,O. N12 .....5.20
Torrance,Calif. C11 ...5.875

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy

Cleveland J5, R2 .....5.90
Conshohocken,Pa. A3 ..6.15
Ecorse,Mich. G5 .....6.375
Fairfield,Ala. T2 .....5.90
Fontana,Calif K1 .....7.00
Gary,Ind. U5 .....5.90
Ind.Harbor,Ind. I-2 ....5.90
Ind.Harbor,Ind. Y1 ....6.40
Irvin,Pa. U5 .....5.90
Lackawanna(35) B2 ...5.90
Munhall,Pa. U5 .....5.90
Pittsburgh J5 .....5.90
Sharon,Pa. S3 .....5.90
So.Chicago,Ill. U5 ....5.90
SparrowsPoint(38) B2 ..5.90
Warren,O. R2 .....5.90
Weirton,W.Va. W6 ....6.175
Youngstown U5 .....5.90
Youngstown Y1 .....6.40

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10 ..4.175
Cleveland R2 .....4.525
Ind.Harbor,Ind. I-2 ..4.175
Warren,O. R2 .....4.525

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10 .....4.775
Cleveland J5, R2 .....4.775
Ecorse,Mich. G5 .....4.975
Fairfield,Ala. T2 .....4.775
Fairless,Pa. U5 .....4.875
Follansbee,W.Va. F4 ..5.775
Fontana,Calif. K1 ....5.875
Gary,Ind. U5 .....4.775
GraniteCity,Ill. G4 ....5.275
Ind.Harbor,Ind. I-2, Y1 4.775
Irvin,Pa. U5 .....4.775
Lackawanna,N.Y. B2 ..4.775
Middletown,O. A10 ....4.775
Pittsburg,Calif. C11 ..5.725
Pittsburgh J5 .....4.775
SparrowsPoint,Md. B2..4.775
Steubenville,O. W10 ...4.775
Warren,O. R2 .....4.775
Weirton,W.Va. W6 ...4.775
Youngstown Y1 .....4.775

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2 .....7.225
Ecorse,Mich. G5 .....7.675
Fontana,Calif. K1 .....8.275
Gary,Ind. U5 .....7.225
IndianaHarbor,Ind. Y1 .7.725
Irvin,Pa. U5 .....7.225
Lackawanna(37) B2 ...7.225
Pittsburgh J5 .....7.225
SparrowsPoint (38) B2 7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ...7.475
Youngstown Y1 .....7.725

SHEETS, Cold-Rolled Ingot Iron

Butler,Pa. A10 .....5.275
Cleveland R2 .....5.375
Middletown,O. A10 ....5.275
Warren,O. R2 .....5.375

SHEETS, Gal'd No. 10 Steel

AlabamaCity,Ala. R2 ..5.275
Ashland,Ky (8) A10 ...5.275
Canton,O. R2 .....5.275
Dover,O. R1 .....5.475
Fairfield,Ala. T2 ....5.275
Gary,Ind. U5 .....5.275
GraniteCity,Ill. G4 ....5.475
Ind.Harbor,Ind. I-2 ...5.325
Irvin,Pa. U5 .....5.275
Kokomo,Ind. C16 .....5.375
MartinsFerry,O. W10 ..5.275
Niles,O. N12 .....5.80
Pittsburg,Calif. C11 ...6.025
SparrowsPoint,Md. B2 5.275
Steubenville,O. W10 ..5.275
Torrance,Calif. C11 ...6.025
Weirton,W.Va. W6 ....5.275

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5 .....7.925
SparrowsPoint(39) B2 .8.075

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10 ..5.525
Canton,O. R2 .....6.025

SHEETS, Culvert

	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.325	....
Canton,O. R2	6.475	6.925
Fairfield (41) T2	6.075	6.325
Gary,Ind. U5	6.075	6.325
Ind.Harbor I-2	6.075	6.325
Irvin,Pa.(41) U5	6.075	6.325
Kokomo,Ind. C16	6.525	....
MartinsFry.,O.W10	6.075	....
Niles,O. C1	6.825	....
SparrowsPt. B2	6.075	....
Torrance,Calif.C11	6.825	....

SHEETS, Culvert

	Pure Iron
Ashland,Ky. A10	6.075
FairBeld,Ala.(41) T2	6.325
MartinsFerry,O. W10	6.325

SHEETS, Galvannealed Steel

Canton,O. R2 .....5.825
Irvin,Pa. U5 .....5.825
Kokomo,Ind.(13) C16 ..5.92
Niles,O. N12 .....6.35

SHEETS ZINCGRIP STEEL

Butler,Pa. A10 .....5.525
Middletown,O. A10 ....5.525

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10 .....5.775
Middletown,O. A10 ....5.775

SHEETS, Electro Galvanized

Cleveland R2 (28) 6.127
Niles,O. R2 (28) 6.125
Weirton,W.Va. W6 ....5.975

SHEETS, ALUMINIZED

Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ...5.175
Cleveland R2 .....5.175
Gary,Ind. U5 .....5.175
GraniteCity,Ill. G4 ....5.875
Ind.Harbor,Ind. I-2 ...5.175
Irvin,Pa. U5 .....5.175
Middletown,O. A10 ....5.175
Youngstown Y1 .....5.175

BLUED STOCK, 29 ga.

Yorkville,O. W10 .....7.20
Follansbee,W.Va. F4 ..7.30
Follansbee (23) F4 ..7.175

SHEETS, Long Terne Steel (Commercial Quality)

BeechBott'm,W.Va.W10 5.675
Gary,Ind. U5 .....5.675
Mansfield,O. E6 .....6.25
Middletown,O. A10 ....5.675
Niles,O. N12 .....6.00
Weirton,W.Va. W6 ....5.675

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....6.075

SHEETS, Well Casing

Fontana,Calif. K1 ....6.20

—STRIP—

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(28) R2 ..3.92
Alton,Ill. L1 .....4.20
shland,Ky(8) A10 ..3.925
A.anta A11 .....4.475
Bessemer,Ala. T2 ....3.925
Bridgeport,Con.(10)S15 4.425
Buffalo (27) R2 .....3.925
Butler,Pa.(8) A10 ....3.92
Carnegie,Pa. S18 .....4.425
Conshohocken,Pa. A3 ..4.325
Detroit M1 .....4.40
Ecorse,Mich. G5 .....4.225
Fairfield,Ala T2 .....3.925
Fontana,Calif. K1 .....4.70
Gary,Ind. U5 .....3.925
Houston,Tex. S5 .....4.425
Ind.Harbor,Ind. I-2 ...3.925
Johnstown,Pa.(25) B2..3.925
KansasCity,Mo.(9) S5..4.625
Lackw'na,N.Y.(32) B2 3.925
LosAngeles(25) B3 .....4.675
Milton,Pa. B6 .....4.35
Minnequa,Colo. C10 ....5.025
NewBritain(10) S15 ....4.425
N Tonawanda,N.Y. B11 3.925
Pittsburg,Calif. C11 ...4.675
Riverdale,Ill. A1 .....3.925
SanFrancisco S7 .....5.10
Seattle(25) B3 .....4.925)
Seattle N14 .....4.925
Sharon,Pa. S3 .....4.22)
So.Chicago,Ill. W14 ....3.925
So.SanFrancisco(25) B3 4.675
SparrowsPoint,Md. B2 ..3.925
Torrance,Calif. C11 ...4.675
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ....4.025
Youngstown Y1, U5 ....3.925

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10)S15 6.45
Carnegie,Pa. S18 .....6.45
Fontana,Calif. K1 .....7.80
Gary,Ind. U5 .....6.40
Houston,Tex. S5 .....6.90
KansasCity,Mo. S5 ....7.10
LosAngeles B3 .....7.60
NewBritn.,Conn.(10)S15 6.45
Sharon,Pa. S3 .....6.45
So.Chicago W14 .....6.40
Youngstown U5 .....6.40

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2 ....5.65
Conshohocken,Pa. A3 ..6.20
Ecorse,Mich. G5 .....6.50
Fairfield,Ala. T2 .....5.65
Fontana,Calif. K1 .....7.05
Gary,Ind. U5 .....5.95
Ind.Harbor,Ind. I-2 ....5.95
Ind.Harbor,Ind. Y1 ....6.45
Lackawanna,N.Y. B2 ...6.00
LosAngeles(25) B3 ....6.40
Seattle(25) B3 .....6.65
Sharon,Pa. S3 .....5.95
So.SanFrancisco(25)B3 ..6.40
SparrowsPoint,Md. B2 ..6.00
Warren,O. R2 .....5.95
Weirton,W.Va. W6 ....6.30
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ...4.175
Warren,O. R2 .....4.525

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....5.80
Bridgeprt,Conn.(10) S15 6.15
Butler,Pa. A10 .....5.45
Cleveland A7, J5 .....5.45
Dearborn,Mich. D3 ....6.05
Detroit D2 .....5.95
Detroit M1 .....5.45
Dover,O. G6 .....5.80
Ecorse,Mich. G5 .....5.65
Follansbee,W.Va. F4 ...5.45
Fontana,Calif. K1 .....7.35
FranklinPark,Ill.(40) T6 5.70
Ind.Harbor,Ind. I-2 ....5.70
Lackawanna,N.Y. B2 ...5.45
LosAngeles C1 .....7.50
Mattapan,Mass. T6 ....6.30
Middletown,O. A10 .....5.45
NewBritain(10) S15 ....6.15
NewCastle,Pa.(14) B4 ..5.45
NewCastle,Pa. E5 .....5.95
NewHaven,Conn. A7 ....5.95
NewHaven,Conn. D2 ....6.20
Pawtucket,R.I. R3 ....6.80
Pawtucket,R.I.(21) NS..6.65
Riverdale,Ill. (40) A1 ..5.70
Rome,N.Y.(29) R6 .....5.45
Sharon,Pa. S3 .....5.80
SparrowsPoint,Md. B2 ..5.45
Trenton,N.J. R5 .....7.00
Wall'ford,Conn. W2(50) 6.40
Warren,O.(40) T5 .....5.95
Warren,O. R2 .....5.45
Weirton,W.Va. W6 .....5.45
Worcester,Mass. W19....7.05
Youngstown C8 .....5.95
Youngstown Y1 .....5.45

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)S15 12.15
Carnegie,Pa. S18 .....12.00
Cleveland A7 .....12.00
Dover,O. G6 .....12.00
Fontana,Calif. K1 ....13.65
Harrison,N.J. C18 ....12.00
NewBritn,Conn.(10)S15 12.15
Pawtucket,R.I.(11) NS 12.15
Pawtucket,R.I.(12) NS 12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ...12.30
Youngstown C8 .....12.00

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5 .....7.80
Cleveland A7 .....8.15
Dearborn,Mich. D3 ....7.90
Dover,O. G6 .....8.00
Ecorse,Mich. G5 .....8.50
Lackawanna,N.Y. B2 ...8.15
Sharon,Pa. S3 .....7.65
SparrowsPoint,Md. 8.15
Warren,O. R2 .....7.60
Weirton,W.Va. W6 ....8.30
Youngstown Y1 .....8.30

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....6.05

STRIP, Electro Galvanized

Dover,O. G6 .....5.70
Warren,O. T5 .....5.70
Weirton,W.Va. W6 ....5.45
Youngstown C8 .....8.95

TIGHT COOPERAGE HOOP

Atlanta A11 .....4.65
Riverdale,Ill. A1 .....4.50
Sharon,Pa. S3 .....4.55
Youngstown U5 .....4.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Div. H. K. Porter Co.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept., Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur D. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lake Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W.Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S21 StainlessWeldedProducts
S26 Specialty Wire Co. Inc.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div.,Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel Co.

Y1 Youngstown Sheet&Tube

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	8.00	8.60	10.55	12.85
Bridgeport,Conn.(10) S15	6.15	8.00	8.60	10.55	12.85
Bristol,Conn. W1	...	...	8.90	10.85	...
Carnegie,Pa. S18	...	8.00	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
Dearborn,Mich. D3	6.05	8.25	8.85	...	...
Detroit D2	6.45	7.85	8.45	10.55	...
Dover,O. G6	6.05	8.00	8.60	10.55	12.85
FranklinPark,Ill. T6	5.80	7.80	8.75	10.70	...
Harrison,N.J. C18	...	...	8.90	10.85	13.15
Mattapan,Mass. T6	6.30	7.95	8.90	10.85	13.15
NewBritn.,Conn.(10) S15	6.15	8.00	8.60	10.55	12.85
NewCastle,Pa. B4	5.80	8.00	8.60	...	...
NewCastle,Pa. E5	5.95	8.00	8.60	10.55	12.85
NewHaven,Conn. D2	6.70	7.95	8.55	10.50	...
NewYork W3	...	8.30	8.90	10.85	13.15
Pawtucket,R.I. N8:					
Cleve.orPitts.Base	...	8.00	8.60	10.55	12.85
Worcester,Mass.,Base	6.65	7.95	8.90	10.85	13.15
Sharon,Pa. S3	...	8.00	8.60	10.55	12.85
Trenton,N.J. R5	...	8.30	8.90	10.85	13.15
Wallingford,Conn. W2	6.65	7.95	8.90	10.85	13.15
Warren,O. T5	6.20	8.00	8.60	10.55	12.85
Weirton,W.Va. W6	5.80	8.00	8.60	10.55	12.85
Worcester,Mass. A7	5.75	7.95	8.90	10.85	13.15
Worcester,Mass. T6	6.30	7.95	8.90	10.85	13.15
Youngstown C8	...	8.00	8.60	10.55	12.85
Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	12.50	15.00	...
FranklinPark,Ill. T6	...	...	12.50	15.00	18.00
Trenton,N.J. R5	...	...	12.50	15.00	18.00
Harrison,N.J. C18	...	...	12.50	15.00	18.00
New York W3	...	...	12.50	15.00	18.00
Worcester,Mass. T6	...	...	12.50	15.00	18.00
Youngstown C8	...	...	10.30	12.50	15.35

SILICON STEEL

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut lengths ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom W10 (cut lengths)	...	...	8.35	9.60	10.40
Brackenridge,Pa. A4	...	...	8.85	10.10	10.90
GraniteCity,Ill. G4 (cut lengths)	...	...	8.55	9.80	...
IndianaHarbor,Ind. I-2	8.05	8.35	8.85	(34)	...
Mansfield,O. E6 (cut lengths)	7.55	7.85	8.35	9.60	10.40
Newport,Ky. N9 (cut lengths)	...	7.85	8.35	9.60	10.40
Niles,O. N12 (cut lengths)	7.55	7.85	8.35	...	...
Vandergrift,Pa. U5	...	8.35	8.85	10.10	10.90
Warren,O. R2	8.05	8.35	8.85	10.10	10.90
Zanesville,O. A10	...	8.35	8.85	10.10	10.90

SHEETS, SILICON (22 Ga. Base) COILS (Cut Lengths ½c lower)	Transformer 72	65	Grade 58	52
BeechBottom W10 (cut lengths)	10.95	11.50	12.20	13.00
Brackenridge,Pa. A4	11.45	....	....	....
Newport,Ky. N9 (cut lengths)	10.95	....	....	....
Vandergrift,Pa. U5	11.45	12.00	12.70	13.50
Warren,O. R2	11.45	....	....	....
Zanesville,O. A10	11.45	12.00	12.70	13.50
H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	**T-100**	**T-90**	**T-80**	**T-73**
Butler,Pa. A10 (C.R.)	....	....	16.05	16.55
Vandergrift,Pa. U5	14.00	14.85	15.85	16.35

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Fairless,Pa. U5	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	...	...
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yourkville,O. W10	7.40	7.65	8.05

TIN PLATE, American 1.25 Coke (Base Box)	lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Fairless,Pa. U5	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	...
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Fairless,Pa. U5	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2,Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburgh,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)	
Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.55

MANUFACTURING TERNES (Special Coated)	
Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

MANUFACTURING TERNES, 8 lb (Commercial Quality)	
Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

MANUFACTURING TERNES, LT. Coated, 6 lb	
Yorkville,O. W10	$8.65

ROOFING SHORT TERNES (8 lb Coated)	
Gary,Ind. U5	9.75

—WIRE—

WIRE, Manufacturers Bright, Low Carbon	
AlabamaCity,Ala. R2	5.525
Aliquippa,Pa. J5	5.525
Atlanta A11	5.775
Alton,Ill. L1	5.75
Bartonville,Ill. K4	5.625
Buffalo W12	5.525
Chicago W13	5.525
Cleveland A7, C20	5.525
Crawfordsville,Ind. M8	5.625
Donora,Pa. A7	5.525
Duluth,Minn. A7	5.525
Fairfield,Ala. T2	5.525
Fostoria,O. (24) S1	6.02
Houston S5	5.925
Johnstown,Pa. B2	5.525
Joliet,Ill. A7	5.525
KansasCity,Mo. S5	6.125
Kokomo,Ind. C16	5.625
LosAngeles B3	6.475
Minnequa,Colo. C10	5.775
Monessen,Pa. P7	5.525
No.Tonawanda B11	5.525
Palmer,Mass. W12	5.825
Pittsburg,Calif. C11	6.475
Portsmouth,O. P12	5.725
Rankin,Pa. A7	5.525
So.Chicago,Ill. R2	5.525
So.SanFrancisco C10	6.475
SparrowsPoint,Md. B2	5.625
Sterling,Ill. (1) N15	5.525
Struthers,O. Y1	5.525
Torrance,Calif. C11	6.475
Waukegan,Ill. A7	5.525
Worcester,Mass. A7	5.825

WIRE, MB Spring, High Carbon	
Aliquippa,Pa. J5	6.925
Alton,Ill. L1	7.15
Bartonville,Ill. K4	7.025
Buffalo W12	6.925
Cleveland A7	6.925
Donora,Pa. A7	6.925
Duluth,Minn. A7	6.925
Fostoria,O. S1	6.925
Johnstown,Pa. B2	6.925
Milbury (12) N6	8.725
Minnequa,Colo. C10	7.175
Monessen,Pa. P7	6.925
Monessen,Pa. P16	6.95
Muncie,Ind. I-7	7.125
Palmer,Mass. W12	7.225
Pittsburg,Calif. C11	7.875
Roebling,N.J. R5	7.225
Portsmouth,O. P12	6.925
So.Chicago,Ill. R2	6.925
So.SanFran. C10	7.875
SparrowsPt.,Md. B2	7.025
Struthers,O. Y1	6.925
Trenton,N.J. A7	7.225
Waukegan,Ill. A7	6.925
Worcester A7, J4	7.225
Worcester T6, W12	7.225

WIRE, Upholstery Spring	
Aliquippa,Pa. J5	6.625
Alton,Ill. L1	6.85
Buffalo W12	6.625
Cleveland A7	6.625
Donora,Pa. A7	6.625
Duluth,Minn. A7	6.625
Johnstown,Pa. B2	6.625
LosAngeles B3	7.575
Minnequa,Colo. C10	6.875
Monessen,Pa. P7	6.625
Monessen,Pa. P16	6.625
NewHaven,Conn. A7	6.925
Palmer,Mass. W12	6.925
Pittsburg,Calif. C11	7.575
Portsmouth,O. P12	6.625
Roebling,N.J. R5	6.925
So.Chicago,Ill. R2	6.625
So.SanFrancisco C10	7.575
SparrowsPoint,Md. B2	6.725
Torrance,Calif. C11	7.575
Trenton,N.J. A7	6.925
Waukegan,Ill. A7	6.625
Worcester,Mass. A7	6.925

WIRE, Fine & Weaving (8"Coils)	
Alton,Ill. L1	10.75
Bartonville,Ill. K4	10.65
Buffalo W12	10.55
Chicago W13	10.55
Cleveland A7	10.55
Crawf'sville,Ind. M8	10.55
Fostoria,O. S1 (43)	6.925
Jonnstown,Pa. B2 (43)	8.90
Kokomo,Ind. C16	10.55
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.85
Roebling,N.J. R5	10.85
So.SanFrancisco C10	10.90
Waukegan,Ill. A7	10.55
Worcester,Mass. A7	10.85
Worcester,Mass. T6	10.85

WIRE, Galv'd ACSR for Cores	
Bartonville,Ill. K4	9.50
Johnstown,Pa. B2	9.50
Monessen,Pa. P16	9.50
Muncie,Ind. I-7	9.70
Roebling,N.J. R5	9.80
SparrowsPt.,Md. B2	9.60

ROPE WIRE (A)	
Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.35
Buffalo W12	9.35
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.35
Monessen,Pa. P16	9.35
Monessen,Pa. P7	9.35
Muncie,Ind. I-7	9.55
Palmer,Mass. W12	9.65
Portsmouth,O. P12	9.35
Roebling,N.J. R5	9.65
SparrowsPt. B2	9.45
Struthers,O. Y1	9.35
Worcester J4, T6	9.65

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Tire Bead	
Alton,Ill. L1	12.75
Bartonville,Ill. K4	12.65
Monessen,Pa. P16	12.00
Roebling,N.J. R5	12.85

WIRE, Cold-Rolled Flat	
Anderson,Ind. G6	7.45
Buffalo W12	7.45
Cleveland A7	7.45
Crawf'sville,Ind. M8	7.55
Dover,O. G6	7.45
Fostoria,O. S1 (43)	6.00
Kokomo,Ind. C16	7.55
FranklinPark,Ill. T6	7.60
Massillon,O. R8	7.45
Monessen,Pa. P16	*6.95*
Monessen,Pa. P7	7.45
Pawtkt.R.I.(12) N8	7.75
Trenton,N.J. R5	7.75
Worcester A7, T6, W12	7.75

WIRE, Merchant Quality (6 to 8 gage)	An'ld. Galv.
AlabamaCity R2	6.675 7.075
Aliquippa J5	6.675 7.20*
Atlanta A11	6.925 7.475
Bartonville(19)K4	6.675 7.225
Buffalo W12	6.675 7.075
Cleveland A7	6.675 ....
CrawfordsvilleM8	6.775 7.325
Donora,Pa. A7	6.675 7.075†
Duluth,Minn. A7	6.675 7.075
Fairfield T2	6.675 7.075
Houston,Tex. S5	7.075 7.475
Johnstown B2(48)	6.675 7.225
Joliet,Ill. A7	6.675 7.075†
KansasCity,Mo.S5	7.275 7.675
Kokomo C16	6.775 7.175
LosAngeles B3	7.625 ....
Minnequa C10	6.925 7.325**
Monessen P7(48)	6.675 7.225
Palmer W12	6.975 7.375
Pitts.,Calif. C11	7.625 8.025†
Prtsmth.(18)P12	6.575 ....
Rankin A7	6.675 7.075†
So.Chicago R2	6.675 6.325
So.S.Fra.(48) C10	7.625 8.025**
Spar'wsPt. B2(48)	6.775 7.325
Sterl'g:1)(48)N15	6.675 7.225
Struthers,O. Y1	6.675 7.175
Worcester A7	6.975 ....

*Based on 10c zinc; 15c zinc; **Subject to zinc equalization extras.

WIRE (16 gage)	An'ld. Galv. Stone	Stone
Aliquippa J5	10.63	12.72*
Bartonville(19)K4	10.73	12.51
Cleveland A7	12.50	....
CrawfordsvilleM8	12.50	14.35
Fostoria,O. S1	12.60	14.15
Johnstown B2	12.50	14.35
Kokomo C16	12.60	14.15
Min'qua C10	12.75	14.45**
Palmer,Mass.W12	12.50	14.05
Pitts.Calif. C11	12.85	14.40†
SparrowsPt. B2	12.60	14.45
Sterling(1) N15	10.73	12.15
Waukegan A7	12.50	14.05†
Worcester A7	12.80	....

*Based on 11c zinc; 15c zinc; **Subject to zinc equalization extras.

WIRE, Barbed	Col.
AlabamaCity,Ala. R2	153
Aliquippa, J5	150*
Atlanta A11	159
Bartonville,Ind.(19) K4	156
Crawfordsvill,.Ind. M8	159
Donora,Pa. A7	153†
Duluth,Minn. A7	153†
Fairfield,Ala. T2	153†
Houston,Tex. S5	161
Johnstown,Pa. B2	156
Joliet,Ill. A7	153
KansasCity,Mo. S5	165
Kokomo,Ind. C16	155
Minnequa,Colo. C10	159**
Monessen,Pa. P7	157
Pittsburg,Calif. C11	173†
Rankin,Pa. A7	153†
So.Chicago,Ill. R2	153
S.San.Francisco C10	173**
SparrowsPoint,Md. B2	158
Sterling,Ill.(1) N15	156

†Based on 5c zinc; *11c zinc; **Subject to zinc equalization extras.

WOVEN FENCE, 9-15½ Ga. Col.	
AlabamaCity,Ala. R2	140
Ala.City,Ala.17 ga. R2	235
Ala.City,Ala.18 ga. R2	245
Aliqp'pa,Pa.9-14½ga.J5	143*
Atlanta A11	146
Bartonville,Ill.(19) K4	143
Crawfordsville Ind. M8	145
Donora,Pa. A7	140†
Duluth,Minn. A7	140†
Fairneld,Ala. T2	140†
Houston,Tex. S5	148
Johnstown,Pa. B2	143
Johnstown 17ga.,6" B2	234
Johnstown, 4"	237
Joliet,Ill. A7	140†
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142
Minnequa,Colo. C10	148**
Monessen,Pa. 9 ga. P7	145
Pittsburg,Calif. C11	163†
Rankin,Pa. A7	140†
So.Chicago,Ill. R2	140
Sterling,Ill. (1) N15	143

†Based on 5c zinc; *11c zinc; **Subject to zinc equalization extras.

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	149
Atlanta A11	152
Bartonville,Ill.(19) K4	149
Crawfordsville,Ind. M8	151
Donora,Pa. A7	149
Duluth,Minn. A7	149
Fairfield,Ala. T2	149
Joliet,Ill. A7	149
KansasCity,Mo. S5	161
Kokomo,Ind. C16	151
Minnequa,Colo. C10	154
Pittsburg,Calif. C11	173
So.Chicago,Ill. R2	149
So.SanFran.,Calif. C10	173
SparrowsPoint,Md. B2	151
Sterling,Ill.(1) N15	149

NAILS, Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	131
Aliquippa,Pa. J5	131
Atlanta A11	134
Bartonville,Ill. (19) K4	131
Chicago,Ill. W13	131
Cleveland A9	137
Crawfordsville,Ind. M8	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Galveston,Tex. D7	139
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Joliet, Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	136
Monessen,Pa. P7	131
Pittsburg,Calif. C11	150
Portsmouth,O. P12	132
Rankin,Pa. A7	131
So.Chicago,Ill. R2	131
SparrowsPt.,Md. B2	133
Sterling,Ill. (1) N15	131
Worcester,Mass. A7	137

NAILS, Cut (100 lb keg) to dealers (33)	
Conshohocken,Pa. A3	$8.00
Wheeling,W.Va. W10	8.00

STAPLES, Polished, Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	131
Aliquippa,Pa. J5	133
Atlanta A11	136
Bartonville,Ill. (19) K4	133
Crawfordsville,Ind. M8	135
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Johnstown,Pa. B2	133
Joliet,Ill. A7	133
Kokomo,Ind. C16	135
Minnequa,Colo. C10	138
Monessen,Pa. P7	133
Pittsburg,Calif. C11	152
Portsmouth,O. P12	132
Rankin,Pa. A7	133
So.Chicago,Ill. R2	131
SparrowsPt.,Md. B2	135
Sterling,Ill. (1) N15	133
Worcester,Mass. A7	139

—FENCE POSTS—

	Col.
ChicagoHts.,Ill. C2, I-2	145
Duluth,Minn. A7 (49)	143
Franklin,Pa. F5	145
Johnstown,Pa. B2	*145*
Marion,O. P11	145
Minnequa,Colo. C10	150
Moline,Ill. R2	145
So.Chicago,Ill. R2	145
Tonawanda,N.Y. B12	148
Williamsport,Pa. S19	158

SEAMLESS STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (††)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25
Ambridge, Pa. N2 (†)	18.25	...	22.25	...	24.75	...	26.25	...	26.25	...	26.00	...	28.50	...
Lorain, O. N3 (*)	15.75	4.5	19.75	5.5	22.25	6	23.75	9.5	23.75	9.50	23	8.75	25.5	11.25
Youngstown Y1 (††)	15.75	list	19.75	2.50	22.25	5.00	23.75	6.50	23.75	6.50	23.00	5.75	25.50	8.25

ELECTRIC WELD STANDARD PIPE, T & C

Youngstown R2 (††)	15.75	list	19.75	2.5	22.25	5.0	23.75	6.5	23.75	6.5	23.0	5.75	25.5	8.25

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼		1½	
List Per Ft.	5.5c		6c		6c		8.5c		11.5c		17c		23c		27.5c	
Pounds Per Ft.	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73	
	Blk	Galv.	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv.
Aliquippa, Pa. J5 (††)	....	....	....	....	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Alton, Ill. L1 (§)	....	....	....	....	....	....	23.25	7	26.25	11	28.75	14.5	31.25	15.5	31.75	16.5
Benwood, W.Va. W10(††)	25.5	+0.75	17.75	+6	10.25+10.75		26.25	10	29.25	14	31.76	17.5	34.25	18.5	34.75	19.5
Butler, Pa. F6 (†)	26.5	+2.75	19.5	+7.25	12.5	+13	....	....	....	....	....	....	....	....	....	....
Etna, Pa. N2 (†)	28	+1.25	22	+4.75	16	+9.5	28.75	9.5	31.75	13.5	34.25	17	36.75	18.75	37.25	19.75
Fontana, Calif. K1 (††)	....	....	....	....	....	....	13.25	+3	16.25	1	18.75	4.5	21.25	5.5	21.75	6.5
Ind. Harbor Y1 (††)	....	....	....	....	....	....	25.25	9	28.25	13	30.75	16.5	33.25	17.5	33.75	18.5
Lorain, O. N3 (*)	....	....	....	....	....	....	26.25	16	29.25	20	31.76	23.5	34.25	23	34.75	24
Sharon, Pa. S4 (†)	28	+1.75	22	+1.75	16	+5	....	....	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Sparrows Pt., Md. B2 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	24.25	8	27.25	12	29.75	15.5	32.25	16.5	32.75	17.5
Youngstown R2 (††)	....	....	....	....	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Youngstown Y1 (††)	....	....	....	....	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Wheatland, Pa. W9 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.25	14	31.75	17.50	34.25	18.50	34.75	19.50

Size—Inches	2		2½		3		3½		4	
List Per Ft.	37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft.	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....
Alton, Ill., L1 (§)	32.25	17	33.75	17	33.75	17	....	....	....	....
Benwood, W.Va. W10(††)	35.25	20	36.75	20	36.75	20	27.75	10.5	27.75	10.5
Etna, Pa. N2 (†)	37.75	20.25	39.25	21	39.25	21	30.25	11.5	30.25	11.5
Fontana, Calif. K1 (††)	22.25	7	23.75	7	23.75	7	....	....	....	....
Ind. Harbor, Ind. Y1 (††)	34.25	19	35.75	19	35.75	19	....	....	....	....
Lorain, O. N3 (*)	35.25	24.5	36.75	23	36.75	23	....	....	....	....
Sharon, Pa. M6	35.25	20	36.75	20	36.75	20	....	....	....	....
Sparrows Pt., Md. B2 (§)	33.75	18	34.75	18	34.75	18	25.75	8.5	25.75	8.5
Youngstown R2 (††)	35.25	20	36.75	20	36.75	20	27.75	10.5	27.75	10.5
Youngstown Y1 (††)	35.25	20.00	36.75	20.00	36.75	20.00	....	....	....	....
Wheatland, Pa. W9 (§)	35.25	20	36.75	20	36.75	20	....	....	....	....

Galvanized pipe discounts based on zinc price of: (†), 14c (†), 14c; (‡), 11c to under 12c; (*), 5c; (§), 11.00c; (††), 10.59c-11.50c; with discounts adjusted on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft., inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	21.31	18.44
1¼	13	....	25.24	18.12
1½	13	23.12	27.89	20.01
1¾	13	26.84	32.37	23.66
2	13	30.08	36.28	26.51
2¼	13	34.18	41.23	29.86
2¼	12	37.10	44.75	32.41
2½	12	40.51	48.86	35.70
2¾	12	43.85	52.90	38.66
3	12	45.92	55.39	41.23

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 2	All No. 2	Std. Tee Rails 60 lb Under
Bessemer,Pa. U5	4.325	4.225	4.275	5.20
Ensley,Ala. T2	4.325	4.225	....	5.20
Fairfield,Ala. T2	....	....	....	5.20
Gary,Ind. U5	4.325	4.225	4.275	....
Huntington,W.Va. W7	....	....	....	5.20
Indiana Harbor,Ind. I-2	4.325	4.225	4.275	....
Johnstown,Pa. B2	....	....	(16)5.20	
Lackawanna,N.Y. B2	4.325	4.225	....	5.20
Minnequa,Colo. C10	4.325	4.125	....	5.70
Steelton,Pa. B2	4.325	4.225	....	....
Williamsport,Pa. S19	....	....	....	5.20

TIE PLATES

Fairfield,Ala. T2 ....5.125
Gary,Ind. U5 .....5.125
Ind.Harbor,Ind. I-2 ..5.125
Lackawanna,N.Y. B2 ..5.125
Minnequa,Colo. C10 ...5.125
Pittsburg,Calif. C11 ..5.275
Seattle B3 .....5.275
Steelton,Pa. B2 .....5.125
Torrance,Calif. C11 ....5.275

TRACK BOLTS (20) Treated

KansasCity,Mo. S5 ....11.00
Lebanon,Pa. (31) B2 ..10.75
Minnequa,Colo. C10 ...11.00
Pittsburgh P14 .....11.00
Pittsburgh O3 .....11.00

JOINT BARS

Bessemer,Pa. U5 ....5.275
Fairfield,Ala. T2 .....5.275
Ind.Harbor,Ind. I-2 ...5.275
Joliet,Ill. U5 .....5.275
Lackawanna,N.Y. B2 ...5.275
Minnequa,Colo. C10 ...5.275
Steelton,Pa. B2 .....5.275

AXLES

Ind.Harbor,Ind. S13 ...6.50
Johnstown,Pa. B2 .....6.50
Youngstown R2 .....7.05

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1.7.05
KansasCity,Mo. S5 .....7.30
Lebanon,Pa. B2 .....7.05
Minnequa,Colo. C10 ....7.05
Pittsburgh J5 .....7.05
Seattle B3 .....7.55
So.Chicago,Ill. R2 .....7.05
Struthers,O. Y1 .....7.05

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh; f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in.,larger 8.90c
7/16-in. under .....26.5 off

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants per cent off list for less than case lots to consumers)

6 in. and shorter:
½-in. & smaller diam. 4
⅝-in. & ⅝-in. 5
¾-in. and larger .. 3
Longer than 6 in.:
All diams. ..... +4
Lag bolts, all diams.:
6 in. and shorter.... 12
over 6 in. long 8
Ribbed Necked Carriage 5
Blank 25
Plow 25
Step, Elevator, Tap and Sleigh Shoe 12
Tire Bolts ..... List
Boiler & Fitting-Up Bolts 23

NUTS

	Reg.	Hvy.
H.P. & C.P. Square:		
½-in. & smaller	+2	2
⅝-in. & ⅝-in.	+7	+32
¾-in.-1½-in.	+8	+27
1⅝-in. & larger	+9	+27
H.P. Hex.:		
½-in. & smaller	11	8
⅝-in. & ⅝-in.	2	+20
¾-in.-1½-in.	+6	+25
1⅝-in. & larger	+8	+25
C.P. Hex.:		
½-in. & small.	11	8
⅝-in. & ⅝-in.	9	+2
¾-in. & 1¼-in.	+1	+9
1⅝-in. & larger	+16	+20

SEMIFINISHED NUTS

American Standard
(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller.	23	14
⅝-in. & ⅝-in. ..	18	4
¾-in.-1½-in.	8	+8
1⅝-in. & larger.	+14	+20

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)
1 in. diam x 6 in. and shorter 34
1 in. and smaller diam. x over 6 in. 20

HEADLESS SET SCREWS

(Packaged; per cent off list)
No. 10 and smaller ... 34
¼-in. diam & larger .. 14
N.F. thread, all diams. 8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)
Plain finish .....47.5 & 10
Plated finishes .....30 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)
6 in. or shorter:
⅝-in. & smaller 38
⅝-in. through 1 in. .. 22
Longer than 6 in.:
⅝-in. and smaller .. 20
⅝-in. through 1 in.. 7

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛" to 1 7/16"; 1 7/16" to 1 15/16" 4.58c; 1 15/16" to 7 5/16" 4.95c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅛" and thinner.
(16) 40 lb and under
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 5.05c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Add $31.50 per ton.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 9.65c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter; 48" and narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Plus 0.375c per 100 lb.
(43) Plus 4.7% on base and extras.
(48) 6-7 gage.
(49) U-post; add 2 cols. for T-post.
(50) 0.025 gage; 6.55c for 0.026 to 0.068 gage; 6.65c for 0.069 gage and over.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron:	
98+ % Fe, annealed	18.00
Unannealed	14.50
Swedish, c.l.f. N.Y., c.l., in bags	11.25
Electrolytic iron:	
Annealed, 99.5% Fe.	42.50
Unannealed (99+ % Fe)	36.50
Unannealed (99+ % Fe) (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns.	.83.00-148.00
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	34.00
Antimony 500 lb lots	78.00
Brass: 20-ton lots	29.50-36.50
Bronze, 10-ton lots	.51.00-60.00
Copper:	
Electrolytic	43.25
Reduced	43.25
Lead	21.75
Magnesium	.75.00-85.00
Manganese:	
Minus 100 mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	89.50
Nickel-Silver 5-ton lots	47.00
Silicon	38.50
Solder	8.50*
Stainless Steel, 302	91.00
Tin	14.00*
Zinc, 10-ton lots	17.50-25.00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh: 1000 lb and over	5.35
Less than 1000 lb	5.50
Chromium, electrolytic 99.9% Cr min.	3.50

* plus cost of metal.

STAINLESS STEEL MILL PRICES

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. Bars; H.R. Strip	Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	46.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	46.50	41.50
302B	18.50	24.50	30.50	34.50	35.00	35.50	37.50	48.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	48.75	43.75
308	19.50	25.50	....	36.25	37.00	37.50	42.00	51.75	46.75
309	19.75	26.25	35.25	40.75	38.00	42.00	46.00	55.25	48.00
309S	26.50	34.75	43.25	49.25	49.25	50.50	53.75	63.50	62.00
309S	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	67.50	67.50	69.00	72.25	78.75
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.75	54.50	55.00	55.50	59.00	64.50	66.50
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	79.25
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	78.00	80.25
321	22.75	29.50	35.25	40.75	42.00	42.00	46.00	55.50	54.50
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	60.75	59.25
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	42.50	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	40.75	34.25
416	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	49.25	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	43.50	34.75
430F	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	44.00	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
446	....	....	....	38.75	38.25	53.00	39.50	40.75	59.75	71.00
501	....	....	....	14.00	14.50	21.25	16.00	18.25	30.50	29.00
502	....	....	....	15.25	16.00	22.25	17.00	20.00	31.75	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Division, U. S. Steel Corp.; Armco Steel Corp.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur D. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Co.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Division, Borg Warner Corp.; Jessop Steel Co.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; Page Steel & Wire Division, American Chain & Cable Co. Inc.; Republic Steel Corp.; Rome Mfg. Co.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Stainless Welded Products Inc.; Superior Steel Corp.; Timken Roller Bearing Co.; Tube Methods Inc.; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates—Carbon Base 10%	Plates—Carbon Base 20%	Sheets—Carbon Base 20%	Sheets—Copper Base Both Sides
302	....	31.00	31.00	77.00
304	27.60	32.50-32.70	32.50	77.00
310	36.50	41.00	.....	144.00
316	32.60	37.70-42.75	42.75	....
318	37.00	42.20	.....	....
321	29.30	34.40-37.00	37.00	111.00
330	....	70.00	73.75	....
Nickel	33.55	45.15	.....	....
347	30.40	35.50-40.50	40.50	130.00
405	23.40	30.00	.....	....
410	22.90	30.10	.....	....
442	....	35.75	48.25	....
446	....	40.75	59.75	....
Inconel	41.23	54.18	.....	165.00
Monel	34.93	46.28	.....	....
Copper*	....	.....	46.00	....

	Strip, Carbon Base—Cold-Rolled 10%	Strip, Carbon Base—Cold-Rolled Both Sides	Strip, Carbon Base—Hot-Rolled 10%	Strip, Carbon Base—Hot-Rolled Both Sides
Copper*	24.85	35.85	24.00	32.25

* Deoxidized. Production points: Stainless, sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.25-.285	5% Cr Hot Work	0.39
Extra Carbon	0.23-.340	W-Cr Hot Work	0.41
Special Carbon	0.35-.360	V-Cr Hot Work	0.43
Oil Hardening	0.370-.39	Hi-Carbon-Cr.	0.665-.70

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.055
18.25	4.25	1	4.75	...	2.340
18	4	2	9	...	2.565-2.695
18	4	2	...	...	1.820
18	4	1	...	...	1.580-1.660
13.5	4	3	...	...	1.875
6.4	4.5	1.9	...	5	1.065
6	4	3	...	5	1.300
2	1.4	1.2	...	...	0.495
1.5	4	1	...	8.5	0.895

Tool steel producers include: A4, A8, B2 B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Urge Lifting Stainless Nickel Control

Industry task force recommends early revocation of government regulation but it is expected to continue until Oct. 1. Equitable distribution assured

Washington—Although the Stainless Steel Industry Advisory Committee to the National Production Authority has unanimously recommended prompt revocation of that portion of Schedule A of order M-80 covering government control of nickel-bearing stainless steel, indications are such control will not be removed earlier than Oct. 1.

The industry committee recommendation for revocation of the order was made following a report of the industry task group which had been formed to consider the implications of the remaining controls on stainless steel.

NPA officials, meeting with the industry committee, stressed the need for continued assurance of a sufficient supply of nickel-bearing stainless steel to meet defense and atomic energy requirements. However, the industry task force, while agreeing military and atomic energy needs should have first call on supplies, maintained the stainless steel industry is able to assume the responsibility for equitable distribution of the supply remaining for civilian consumption without the need of government controls. Defense and Atomic needs could be met, it was held, by continuance of the production directive provision of NPA order M-1A.

More Stainless Produced

New York—Production of stainless and heat resisting steels reached a new high mark in the first six months of this year, totaling 594,203 net tons, according to the American Iron & Steel Institute. This was an increase of 104,958 tons over the second half of 1952, the previous record period, and it was 181,617 tons more than production in the first half of last year.

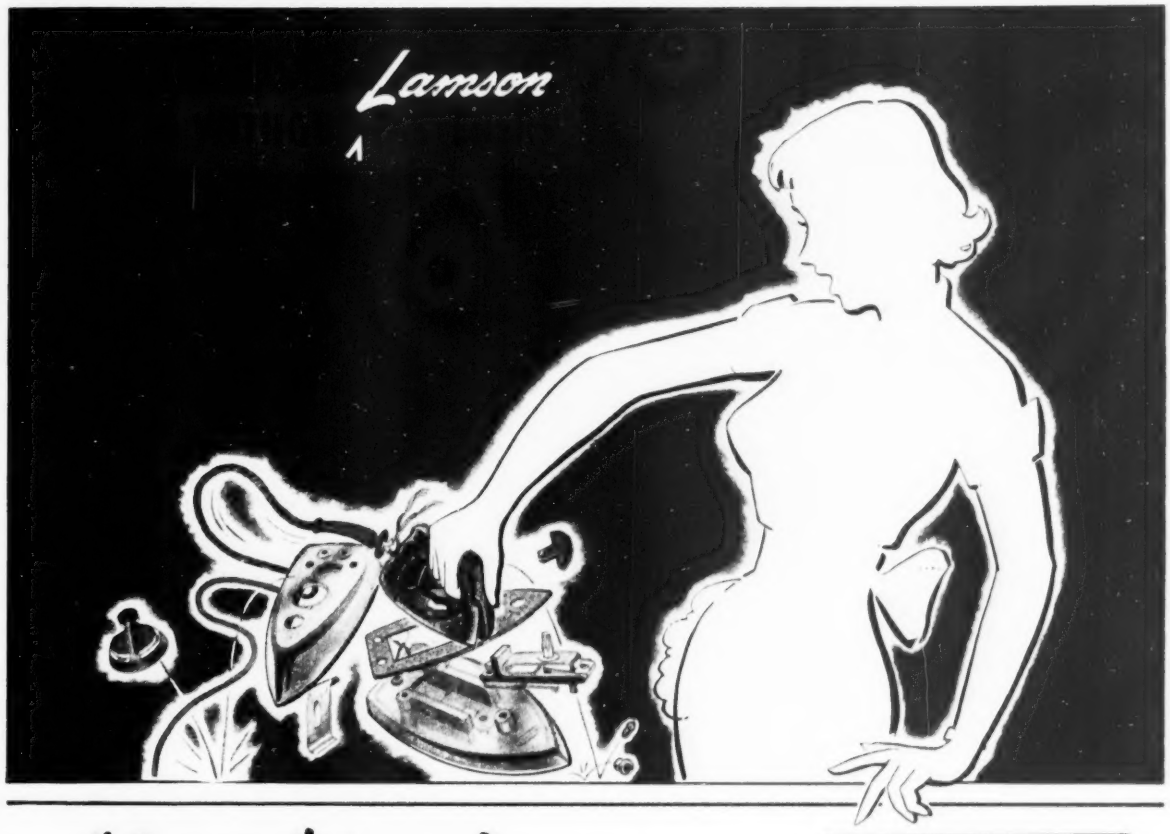
Production declined in second quarter, 1953, compared with output in the first three months of the year, but was substantially greater than in the second quarter of last year.

Output in the second quarter was 290,360 net tons, comparing with 303,843 in the first three months of the year and with 161,982 in the second quarter of 1952.

PRODUCTION OF STAINLESS AND HEAT RESISTING STEEL INGOTS

(Net Tons)

Type	1st Six Months 1953	1st Six Months 1952	1st Six Months 1951
301	5,060	3,919	14,705
302	38,840	28,767	56,518
302B	340	155	62
303	20,336	13,552	11,710
304	61,464	60,821	45,396
308	2,118	7,111	2,812
309	3,101	3,170	2,013
310	7,650	8,267	5,788
316	23,638	19,488	14,943
321	27,458	29,516	25,237
347	5,463	5,076	12,182
403	14,117	14,365	7,263
405	2,068	1,997	1,967
406	709	1,035	2,183
410	24,011	21,097	26,252
414	524	1,015	1,758
416	18,915	20,471	17,387
420	2,619	2,696	3,332
430	267,237	127,459	167,091
430F	1,887	1,337	1,207
431	1,787	2,497	1,881
440A	1,266	880	678
440B	1,157	680	547
440C	2,022	1,681	1,837
442	1,278	893	170
443	250	23	9
446	1,698	1,518	1,858
All other	57,190	33,100	18,120
Total	594,203	412,586	444,906



"Scrap" Iron!

This lady has "pressing problems". She's all set to iron but suddenly the fasteners that hold her gleaming new iron together have disappeared. Without them, her beautiful iron is just scrap.

This is graphic proof that the "unseen workmen"—the fasteners that hold your products together ARE important. Without them there *is* no product.

So take a tip from Lamson and pay attention to the bolts, nuts and screws that go into your product. Chances are there are many opportunities for you to save time and money on the assembly line by using more efficient, or less expensive fasteners.

Lamson & Sessions will be happy to help you ferret out these opportunities for saving money on fasteners. Just call on us . . . *anytime.*

PHILLIPS HEAD SCREWS

Self-aligning and straight-driving features assure you of fast, economical assembly.

Their neat, modern appearance in the finished product show the potential customer the careful attention to detail spent on the product. Sales often "hinge" on just such attention.

Lamson & Sessions

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FOR PROMPT DELIVERY AND HELPFUL SERVICE, ORDER FROM YOUR LAMSON DISTRIBUTOR

MACHINE SCREWS
Precision made for fast, economical assembly

PLUG NUTS
Ideal for blind or hard-to-reach places

TAPPING SCREWS
Choice of round, pan, truss, flat oval, hexagon and Phillips heads.

CAP SCREWS
"1035" Hi-Tensile Heat-treated steel.

SQUARE AND HEX MACHINE SCREW NUTS
Also semi-finished, hot pressed and cold punched nuts

LOCK NUTS
Economical, vibration proof. Can be used repeatedly.

COTTER PINS
Steel, brass, aluminum and stainless steel.

"1035" SET SCREWS
Cup point type, hardened and heat-treated

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, Cincinnati, San Francisco, St. Paul, 15 cents.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.§	H.R. Alloy 4140††[5]		Carbon	Floor
Baltimore	6.20	7.64	7.81	7.00	...	6.86	8.17[6]	12.04	6.98	6.85	7.98
Boston	6.89	7.83	9.23	7.13	...	6.87	8.35	12.28	7.06	7.13	8.26
Buffalo	6.18	7.15	9.01	6.79	...	6.35	7.45	12.17	6.59	6.68	7.88
Birmingham	6.10	7.00	8.00[2]	6.30	...	6.15	8.90	....	6.35	6.35	8.65
Charlotte, N. C.	6.95	7.80	8.69	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.18	7.12	8.05	6.42	...	6.28	7.30	11.75	6.46	6.33	7.46
Cincinnati	6.51	7.19	8.47	6.72	...	6.58	7.66	12.17	6.93	6.85	7.88
Cleveland	6.18	7.12	7.90	6.58	...	6.34	7.65	11.89	6.79	6.50	7.79
Detroit	6.45	7.32	8.34	6.71	...	6.57	7.60	11.92	6.93	6.85	7.80
Houston	7.15	7.85	9.32	7.45	...	7.45	....	....	7.35	7.20	8.55
JerseyCity,N.J.	6.54	7.45	8.72	6.82	...	6.75	8.43[6]	11.84	6.50	6.67	8.01
Los Angeles	7.25	9.00	9.35	7.55	11.20	7.15	9.10	13.05	7.35	7.20	9.25
Milwaukee	6.35	7.29	8.22	6.59	...	6.45	7.57	11.92	6.63	6.50	7.63
Moline, Ill.	6.53	7.47	8.40	6.77	...	6.63	7.65	....	6.81	6.68	...
New York	6.54	7.45	8.72	6.82	...	6.75	8.43[6]	11.84	6.50	6.67	8.01
Newark, N. J.	6.78	7.75	9.02	7.16	...	7.06	8.43[6]	....	6.90	6.99	8.30
Norfolk, Va.	6.90	...	...	7.20	...	7.20	8.50	....	7.20	7.15	7.85
Philadelphia	6.53	7.55	8.35	7.02	8.80	6.87	8.19[6]	11.89	6.67	6.63	7.65
Pittsburgh	6.18	7.12	8.30	6.55	...	6.28	7.65	11.75	6.46	6.33	7.46**
Portland, Oreg.	7.90	9.30	10.00	7.90	...	7.60	10.90	....	7.50	7.55	9.40
Richmond, Va.	6.50	7.45	8.00	7.10	...	7.05	7.95	....	7.10	6.85	8.10
St. Louis	6.48	7.42	8.35	6.72	...	6.58	7.70	12.05	6.86	6.73	7.86
St. Paul	6.84	7.78	8.71	7.08	...	6.94	8.06	....	7.12	6.99	8.12
San Francisco	7.35	8.70	10.15	7.60	...	7.15	9.75	13.05	7.25	7.20	9.25
Seattle	8.15	8.70	10.10	8.02	...	7.58	10.13	13.50	7.50	7.59	9.40
Spokane	8.45	9.25	9.80	8.40	...	7.95	10.55	13.20	7.45	7.45	9.80
Washington	6.71	8.15	8.35	7.51	...	7.37	8.43	....	7.49	7.36	8.49

*Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes 35-cent special bar quality extra; § as rolled; †† as annealed; ** ⅛" and heavier, 8.09c for No. 12 and lighter. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; Cold-finished bars, 2000 lb and over; [2]—500 to 9999 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over.

Short Supplies Limit Warehouse Sales

Stringency in some products, including hot and cold-rolled sheets, plates, large-size bars and wide flanged beams, prevents distributors from accepting all orders offered

Cleveland—Steel merchants in this area were under somewhat less demand pressure last month because of manufacturing curtailments attending the vacation season. Some improvement in order volume is expected this month but most sellers do not look for marked improvement until after Labor Day by which time vacations will be pretty well over and more normal conditions prevail.

Despite the easing in demand pressure in July warehouse order volume continues substantial and in some products it would be heavier were the distributors' stocks such as to permit filling all the requests of customers.

While over-all stocks have been improving, inventories of district warehouse operators continue unbalanced. Supply pinches are chiefly noticeable in hot and cold-rolled sheets, plates, large-size bars and some structurals, notably wide flanged beams.

Philadelphia—On a tonnage basis, warehouse business in July fell off about 10 per cent, reflecting seasonal influences. Distributors, however, regard the showing as good and as being even better on a dollar basis because of higher prices generally in effect during the month. An improvement may come this month, but it will be slight some distributors think. Wide flange shapes are the most critical supply item with warehouses unable to build inventories and demand pressure insistent. Over-all stocks are larger.

Boston — Warehouses are placing the bulk of steel orders for fourth quarter on specifications, sizes and grades wanted. No longer will distributors accept just what is offered. This reflects better balanced inventory on most products and mill shipments are closer to schedule. More wide bands are available for slitting, also plates for machine cutting. Some improvement in the supply of cold-rolled sheets is reported by some sellers as developing.

Cincinnati — Business volume in July appeared to be a little better than in June. August is expected to continue at the July level. With the exception of the flat rolled and structural products, demand in all lines seems to be easing a little though this in part is due to seasonal influences.

San Francisco—Steel distributors expect business to continue on a high level for several months judged on the steady amount of business still coming their way.

Los Angeles—Warehouse volume in July was slightly reduced from June levels. Fabricators are buying for current requirements and demand is still active. Influenced by geographic closeness to the Far East, most trade observers are pessimistic regarding the good faith of the Reds in the peace negotiations. Playing it safe, distributors generally intend to keep inventories high—to take everything they can get from mills even though supply conditions may ease.

Tool Steel . . .

Tool Steel Prices, Page 162

New York—Shipments of high speed and tool steel, exclusive of hollow drill steel, totaled 63,905 net tons in the first six months of this year, the American Iron & Steel Institute reports.

This was a decline of 3857 tons compared with shipments of 67,762 tons in the like period of 1952, and a drop of 23,111 tons compared with shipments of 87,016 tons in the corresponding six months of 1951.

During June shipments were 11,505 tons, an increase compared with 10,863 tons in May, and sharply up from shipments of only 5100 tons in June a year ago. In June of 1951 shipments amounted to only 14,775 net tons.

Plate Supply Stringency Intensified

Tight situation prevails in both heavy and light gages. Withdrawal of an estimated 200,000 tons of strip-plate monthly from market an increasingly noticeable factor

Plate Prices, Page 158

New York—Stringency in plates is pronounced. This is true, not only in the large heavy sizes, but also in the lighter gages and narrower widths, where the withdrawal of much strip-plate from the market is becoming an increasingly important factor in the situation.

Strip producers, who do not normally engage in production of strip-plate, have been withdrawing from the market as rapidly as possible now that major governmental restrictions have been lifted. The trend is particularly pronounced in view of the continued heavy demand for the light, flat products.

Some trade authorities estimate close to 200,000 tons of strip-plate per month have now been withdrawn from the market, leaving perhaps no more than 50,000 tons of strip-plate production at this time.

Not all plate producers have opened their books for the entire fourth quarter, but those who have, have received a good response from their customers. It is possible that later in the year there may be some cutbacks, but there have been no important suggestions of this to date. In fact, some leading producers look for full operation throughout the fourth quarter, particularly in view of the fact they will have carryovers of at least two to three weeks at the end of the current quarter.

Pittsburgh — Demand remains strong for steel plates. A consumer reports difficulty in obtaining both plates and structurals, with no sign of the market easing. A local construction company says plates are in better supply than six months ago, now obtaining its requirements in 6 weeks to 2 months.

Boston—One aspect of a more orderly demand-supply situation in plates is closer balance between plate and head deliveries in both carbon and chromium clad. The latter average close to 10 weeks. More heavier plates are being taken for weldments and by flame-cutters and a greater volume to specification looms for fourth quarter.

Plate producers are booked into fourth quarter as far as November on a monthly basis. Tank shops have more tonnage, but have not by any means got inventories into normal position.

While capacity will be sold for the final three months, fabricators are more particular as to specifications. They are watching shop costs closer and shy away from premium prices. Weldment shops in some cases have closed on plates for the balance of this year, shaking out orders where possible to avoid the payment of higher extra charges.

Cleveland—Plate supply has noticeably tightened in the lighter gages in recent weeks. This is explained by the fact production on the continuous mills has been sharply reduced with government regulations on production removed.

Meanwhile, demand continues just as pressing as ever and, barring unexpected sharp cutbacks in orders, there appears little prospect of markedly easier supply conditions before next year. Trimming of the defense program may come, but it is thought such will not be felt in the market to any marked extent for some months.

Chicago—Steel industry executives in high places recently have indicated that steelmaking operations in fourth quarter will be less than full capacity. This has provoked a flood of letters and phone inquiries from users who want to know how this can be when their own quotas from the mills are less than their indicated requirements.

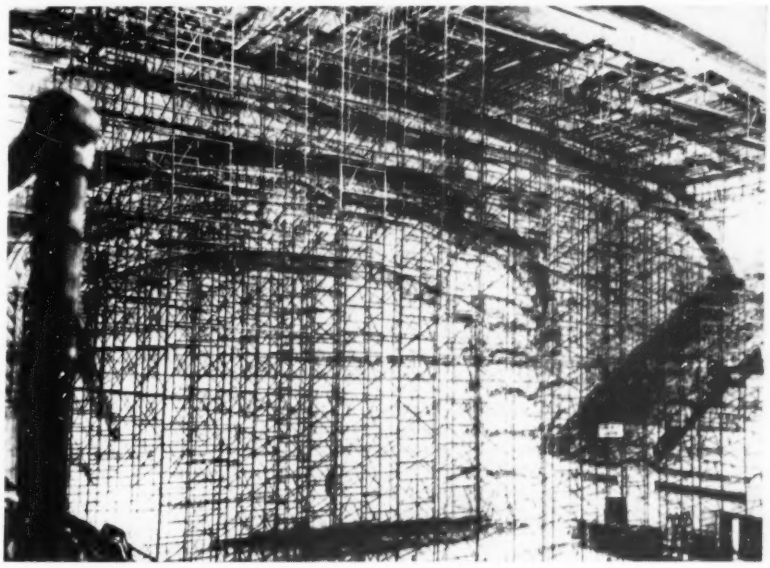
Plate consumers are a heavy proportion of the inquirers. The answer is that the less-than-capacity operations won't apply to all products and that plates will be a notable exception. Mill carryovers on plates from third to fourth quarter will be from two to four weeks.

Philadelphia — Except for ship needs, platemakers are in receipt of a strong diversified demand with the situation tightening as a result of a sharp drop in production of strip-plate. Most strip producers, who normally do not make plate except in a national emergency, are returning to full strip production now that government restrictions are off.

All rolling operations at the plant of the Alan Wood Steel Co., Conshohocken, Pa., will be suspended two weeks for mass vacations. The shipping department closes down a week later for a similar period.

Birmingham—Plate users are still asking for more tonnage. At least the larger users are in need of additional supplies.

It is understood some additional ingots have been diverted to plates in view of less pressure for other items but that does not solve the long range problem. Indications now are for considerable more shipbuilding on the Gulf Coast.

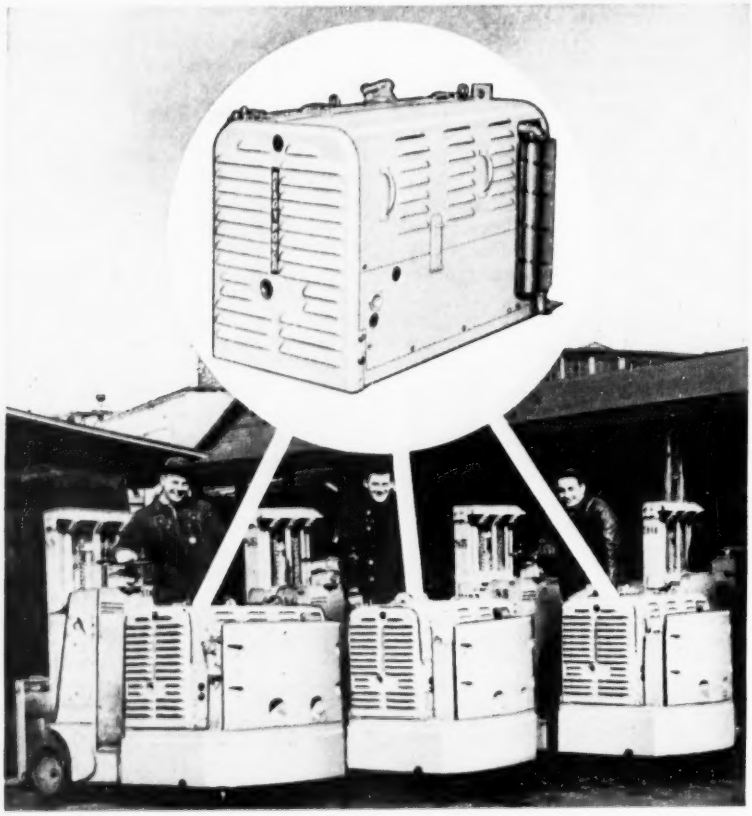


Wide World

Steel Tubing Forms Huge "Jungle Gym"

A maze of scaffolding stretches 87 ft from floor to skylight of Cleveland Public Auditorium. Workmen mount the monkey bar structure to clean and repaint the ceiling. The "jungle gym" was built of 20 to 25 tons of steel tubing

Ready-Power is the only Interchangeable gas-electric power unit



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Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

Sheets, Strip . . .

Sheet and Strip Prices, Page 158 & 159

Cleveland—There isn't anything in the sheet market yet to indicate any slackening in demand. Consumers are taking the tonnage allotted them, and are not having much success obtaining over-allotment tonnage for fourth quarter.

Reports of slackening interest in sheets on the part of certain automotive interests is not confirmed here. Even the appliance manufacturers are ordering in volume despite a leveling out in their business over the recent past.

Most fabricators complain they are not receiving as much tonnage as they can use, that if there is any easing in supply conditions they have as yet failed to experience it.

Currently, the mills are booked full through this quarter and will enter fourth quarter with a substantial order carryover. In fact, some sellers say their carryover will be so great about half of their fourth quarter production will be required to take care of it.

Boston — Only a sharp decline in automobile buying will ease sheet and strip volume to the extent other consuming lines might obtain sufficient tonnage to meet requirements and build inventory in fourth quarter.

Any cutback would especially affect stainless strip. Flat-rolled stainless inventories are heavier, also, consumption. Several sheet mills that are out of this market on carbon flat-rolled are maintaining customer relationships on stainless.

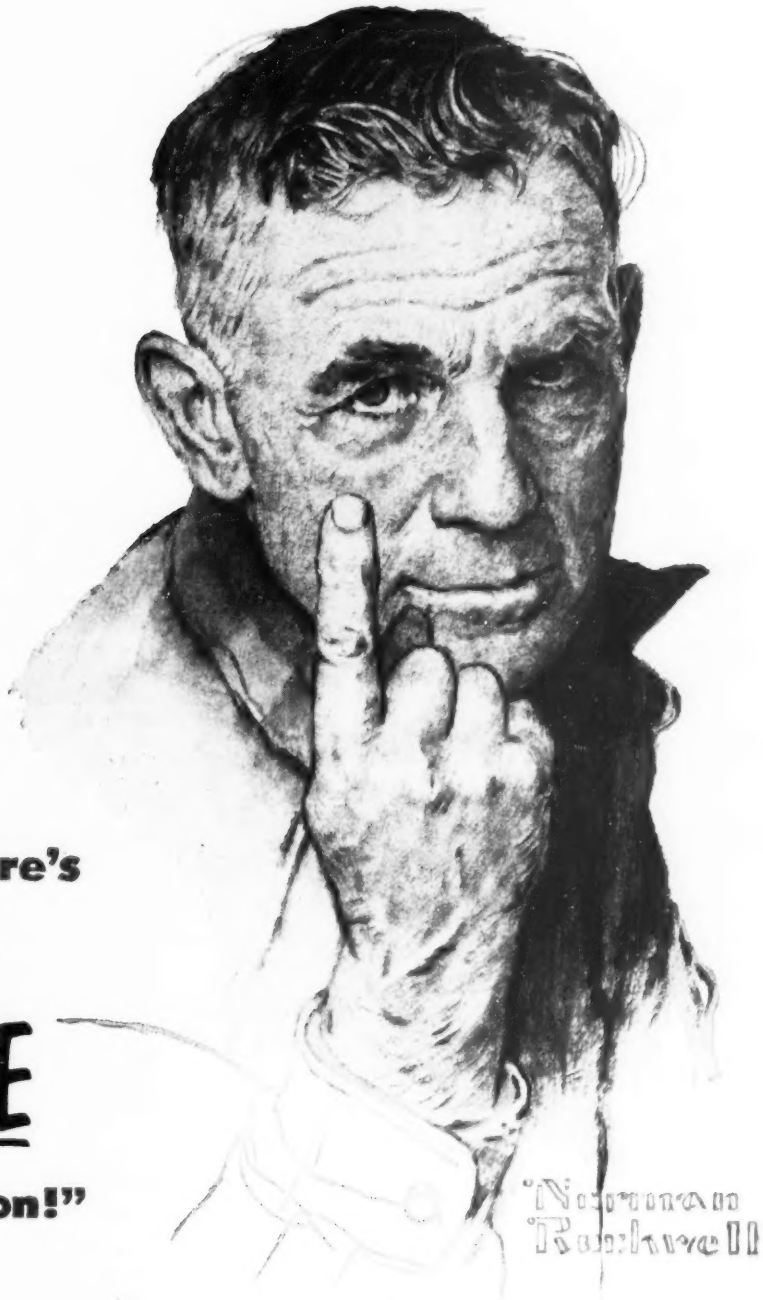
Narrow strip mills are booked heavier into the final quarter than are sheet suppliers. With more capacity getting into gear, consumers are doing less forward buying and are placing orders closer to normal lead-time deadlines.

New York—While sheet consumers are less interested in conversion deals than they were several weeks ago and also are somewhat less interested in foreign steel, they are pushing the mills hard for hot and cold-rolled sheets.

Other sheet items in short supply are enameling stock and electrical sheets. Also, galvanized sheets do not appear in as easy supply as a few weeks ago.

One large eastern producer is operating facilities at virtual capacity. Most sheet producers anticipate a good market throughout remainder of the year.

Philadelphia — Definitely stronger inquiry prevails for galvanized sheets following a lag of several weeks. However, major interest, even rela-



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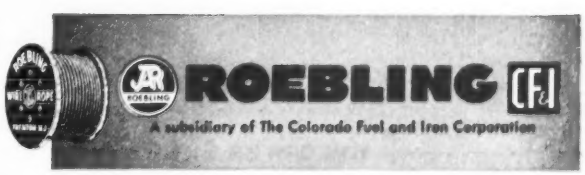

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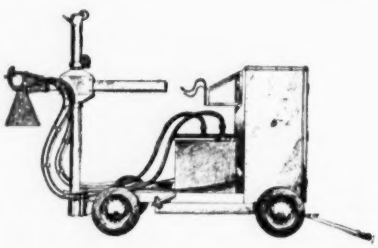

Westinghouse Electric Corporation, X-ray Division, Dept. M-67
2519 Wilkens Avenue, Baltimore 3, Maryland

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tively, still centers in hot-rolled and cold-rolled sheets, enameling stock and electrical sheets.

Pittsburgh — Several producers of sheets report orders are "sticky," coming in slowly for fourth quarter but in about the same amounts as before. Orders from auto manufacturers are slowing down, creating laxity in market activity.

A cold-roller of strip expects fourth quarter business to be slightly below the first three quarters, but good over-all. Cold rollers, while still under allotment of sheets from hot mills, expect to obtain increased amounts soon. Much depends on whether automotive demand holds firm for the fourth quarter.

Cincinnati—Sheets are still supplying the rush in the steel business, with the automotive industry sparking demand. Indications are that August will be another month of continuous pressure for more tonnage.

Chicago—An automaker which has accumulated sizable sheet inventories with production schedules currently off from original projections has cancelled almost a third of its fourth quarter quota with a mill. It should be pointed out, however, that no other car builder has cancelled tonnage. There are reasons to believe though that the industry isn't sure of what its requirements are going to be come fourth quarter. The mill in question is oversold for the quarter and at this moment at least finds demand from all quarters holding strong.

Birmingham — The situation in sheets varies little from week to week which adds up to the fact the territory served by local and district mills still is in need of additional tonnage.

Los Angeles—Demand for flat-rolled steel exceeds supply and sheetmakers are generally 60 to 90 days behind on commitments.

Wire . . .

Wire Prices, Page 160

Boston—For many wire products, carbon and alloy, there are openings for fourth quarter as early as October. Buying has improved slightly as more consumers resume after vacation suspensions, but specifications are frequently revised to meet backlog changes and inventory policy.

Prompt delivery on many wire products has put a damper on forward buying and pressure. This results in scattered cancellations with replacement by new orders frequently calling for smaller tonnage.

Buying of cold heading wire has turned more conservative, also automotive demand. Suppliers to the latter are less certain as to what will be required next quarter.

Birmingham—Wire mill schedules

(*Please Turn to Page* 171)

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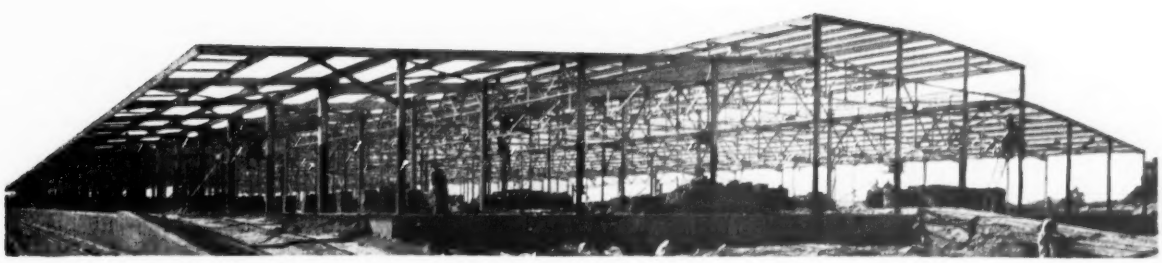

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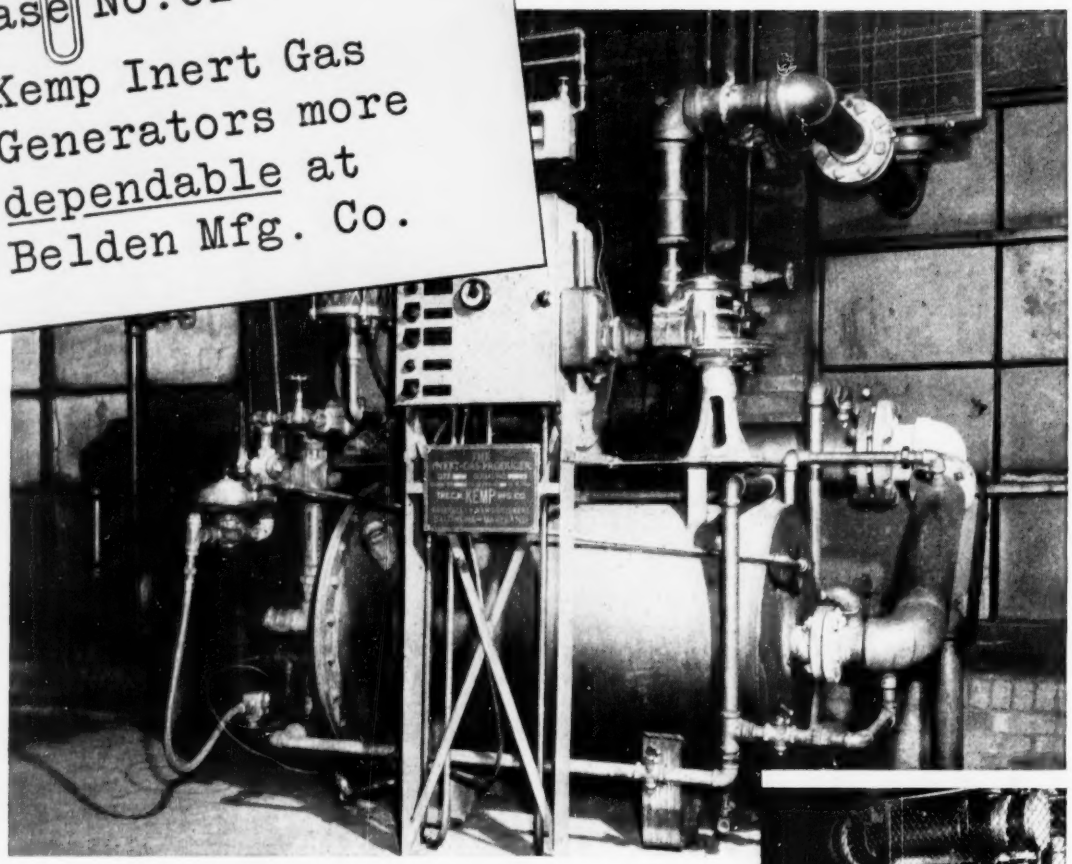
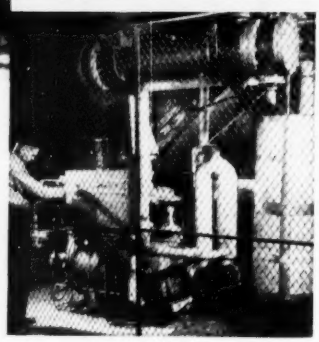
Case No. 61

Kemp Inert Gas Generators more dependable at Belden Mfg. Co.





Generator on first floor of plant is enclosed in wire cage to prevent tampering with controls.

How Belden utilizes two Kemp Generators in annealing copper wire

Annealing copper wire necessitates cooling in an oxygen-free atmosphere to prevent harmful oxidation. For the required protective atmosphere in this process, the Belden Mfg. Co., Chicago, Ill., generates its own inert gas. But the generating equipment formerly used by Belden did not operate reliably . . . results were erratic. So Belden installed two Model MIHE Kemp Inert Gas Generators to handle this important job.

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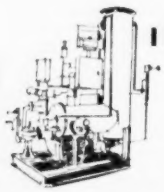

INERT GAS GENERATORS

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SINGEING EQUIPMENT

(*Continued from Page* 168)

are down somewhat with slackening in demand for the product generally. Reports are heard here that a considerable tonnage of German wire has been imported, some of which has moved into regional trade territory.

Steel Bars . . .

Bar Prices, Page 158

Philadelphia—Advices from Washington of a probable stretchout of the shell program may lead to an easing in supply of large hot rounds before end of the year. However, some producers say that any cutbacks likely to develop could easily be absorbed by excess civilian demand. In general, the mills look for a good market in virtually all bar sizes throughout remainder of the year.

Cold-drawn bar sellers report some sluggishness in small sizes but a definitely tight situation in the normally popular sizes, 1 to 2-inches.

Boston—Bar salesmen for the first time in many months are ringing door bells for cold-finished and alloy bar orders under 3-inch. Hot-rolled carbon bar orders are more extended into fourth quarter, but could ease should converters turn back part of allotments, notably in sizes 2-inch and under.

Bulk of consumption of cold finished production in this area is in sizes under 2-inch and inventories are building up. Within these size ranges users experience less difficulty in placing requirements even in hot-rolled.

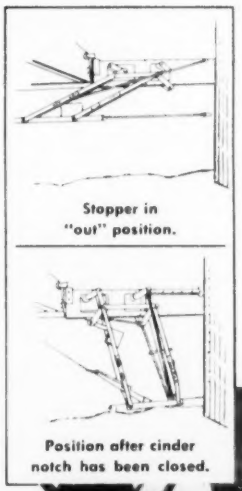
Military cutbacks will not amount to much, being mostly in alloys and stainless.

High carbon flats are in good supply for fourth quarter while bolt manufacturers have a better range of sizes and specifications to match orders against, both carbon and alloys. For textile mill equipment, normally a leading consumer, buying continues slack.

Pittsburgh—A cold-finished bar producer reports his schedules are well filled through much of the fourth quarter. Military orders are active with no changes resulting from the Korean truce.

While over-all demand for bars is strong, demand for conversion steel is dropping. Suppliers of automotive parts report several order cutbacks, due in large part to adjustment of inventories. Specialty steels are still tight here.

Cleveland—As of the present the bar market appears to be in just about as tight supply position as at any time in recent months. There has been a little softening in demand for the smaller sizes of cold-finished carbon bars, but no slackening of pressure is noted for hot bars and produc-



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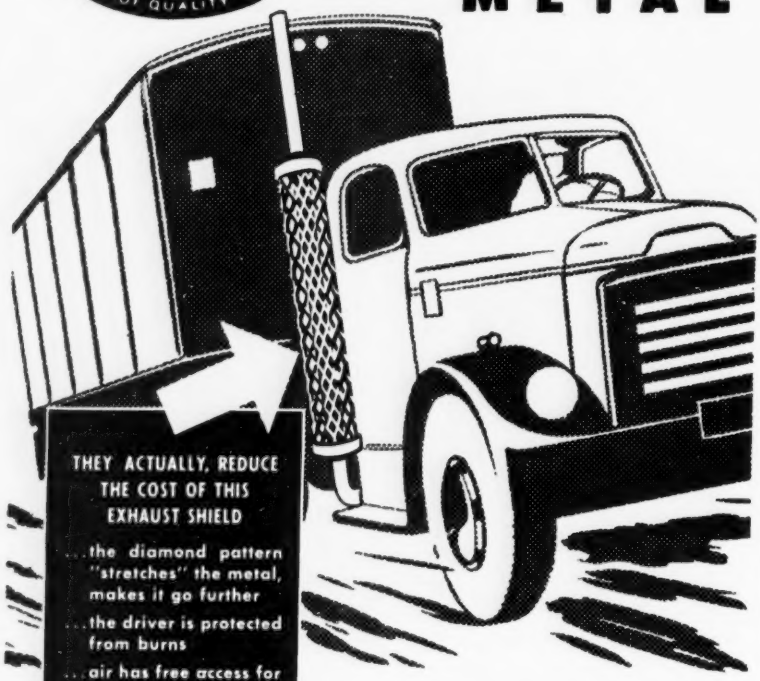

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ers are going to go into fourth quarter with substantial order carryovers.

Despite the strong appearance of the market currently, however, a certain note of uncertainty prevails, especially with respect to fourth quarter. Few cancellations have come through to sellers here so far and there has been no difficulty filling rolling schedules. But the situation could change quickly should the government begin cutting back shell requirements. Such action would relieve considerable pressure on the market, especially in the larger sizes.

Cincinnati—There has been little change in the carbon and alloy bar market here. Carbon bars continue to get easier in supply while alloys remain relatively scarce.

Chicago — Barmakers at this moment at least find themselves oversold for fourth quarter and there is no indication that consumers are going to want less than their quotas. Some, as a matter of fact, indicate they would like to have more. Mills will have two weeks or more carryover from third quarter and larger sizes are much tighter than the smaller ones. Military cutbacks are expected but probably won't be enough to bring supply-demand balance.

Los Angeles — Norris-Thermador Corp., the nation's largest fabricator of artillery cartridge cases and shell fuzes, completed production of 15 million shell cases at its plants at Los Angeles and Modesto, Calif. In a joint statement with the Los Angeles Army Ordnance District the company said it has "no plans for immediate production curtailment".

Tin Plate . . .

Tin Plate Prices, Page 160

Washington — Shipments of metal cans during the first five months this year totaled 1,414,296 tons, against 1,301,792 in the corresponding period of last year, an increase of 9 per cent, according to the Bureau of Census. Shipments in May were up 2 per cent, amounting to 309,816 tons, as against a revised figure of 304,201 in April.

Food cans shipped during May, at 183,049 tons, were 5 per cent above the revised April figure of 174,879. They also were 5 per cent over the total for May, 1952.

Total shipments of food cans during the first five months amounted to 840,034 tons, compared with 794,287 tons in the same period in 1952. May shipments of fruit and vegetable cans, at 73,562 tons, were 15 per cent over the April figure but 5 per cent below the total for May, 1952.

Shipments of non-food cans in May

(*Please Turn to Page* 175)

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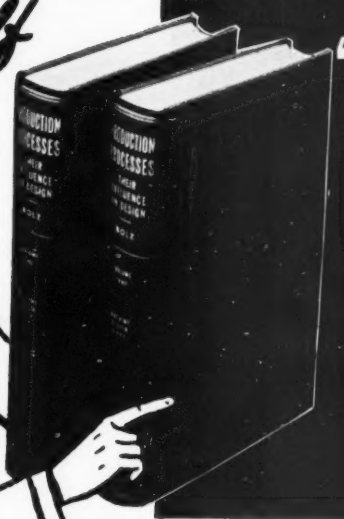

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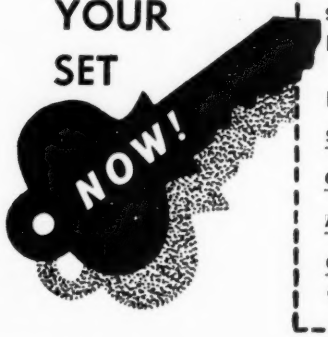

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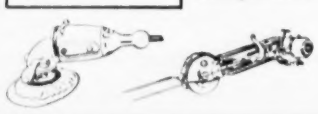

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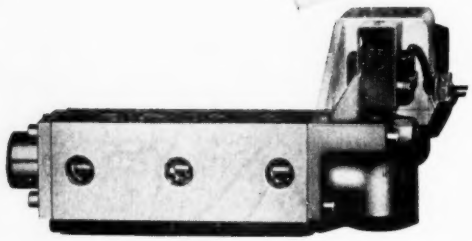

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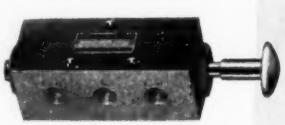

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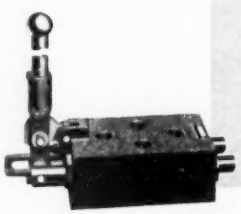

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(Continued from Page 172)

amounted to 126,767 tons, 2 per cent below the April total, but 24 per cent above the total for May, 1952. Cumulative shipments for the first five months, at 574,262 tons, were 13 per cent over the total of 507,505 tons in the corresponding period of last year.

Structural Shapes . . .

Structural Shape Prices, Page 158

New York—While structural fabricators' backlogs are down from a year ago, they are still well above normal, and at least several of the larger shops have backlogs ranging 8 to 10 months. Bridgework is still the major item. However, there is a better ratio of commercial work to bridge construction and perhaps this trend may become more pronounced as fall approaches as some of the outstanding bridge projects should be out of the way by that time.

The smaller fabricating shops are still competing actively for such work as they can handle and which represents a relatively small percentage, tonnage-wise, of the business now coming out.

Boston — Fabricating shops are making slight headway in lowering backlogs. More plate tonnage is available for girder work, also standard shapes, fourth quarter, but wide flanged beams are expected to be one of the last steel products to balance demand.

Foreign angles, channels and small sizes are moving under domestic prices.

Large volume of potential bridge tonnage is building up. Most of this will go under contract for fabrication next year.

Substantial part of the 6000 tons required for the Maine turnpike extension may be bought direct. Beam spans predominate.

Philadelphia—Structural activity is off somewhat, although several sizable jobs are active, including 6000 tons here for a bakery for the National Biscuit Co., New York, and 3800 tons of state bridge work in Philadelphia and Montgomery counties, Pennsylvania. The Pennsylvania railroad shops, Hollidaysburg, Pa., involving more than 6000 tons, are to be redesigned and readvertised.

Los Angeles—Structural mill order books are filling slowly for fourth quarter. Demand is still active for shapes.

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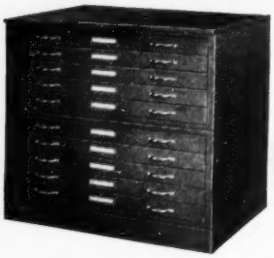

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Mayline metal files consist of a 5-drawer unit, cap, and flush or sanitary base. Units interlock and stack securely. These heavy gauge furniture steel files are electro-welded. Beautiful hammer gray finish.

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The hinged dust cover is a distinctive feature of Mayline steel files. Tilting arms which stay in place when raised control the dust cover made of smooth, plastic coated cotton cloth. Operator can work in drawer with both hands free. Inquire of your local dealer.

In Metal Plan Files—Specify Mayline

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MAYLINE

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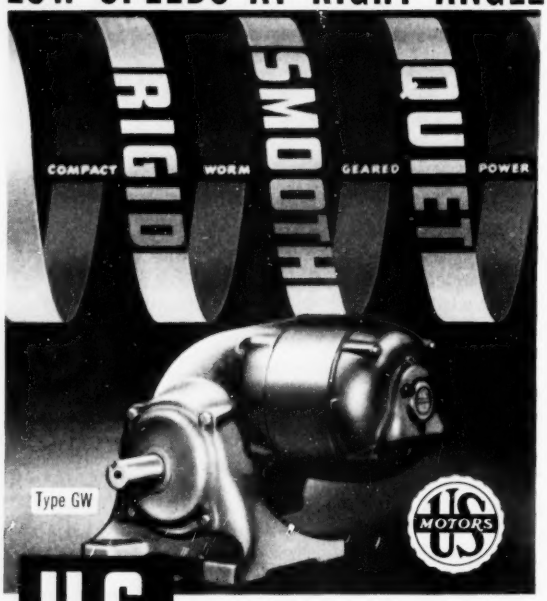
LOW SPEEDS AT RIGHT ANGLE



U.S. SYNCROGEAR MOTOR

20 to 155 RPM—¼ to 3 HP *Request Bulletin*

U.S. ELECTRICAL MOTORS Inc.

BOX 2058, LOS ANGELES 54, CALIFORNIA MILFORD, CONN.

CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton $86, Palmerton, Pa.; $85, Pittsburgh and Chicago; (16% to 19% Mn) $84 per ton, Chicago, Pittsburgh, Palmerton, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $200, Etna, Johnston and Sheridan, Pa.; add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.
(Mn 76-80%) 13.15c per pound of contained Mn, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Oreg.
(Mn 79-81%) Lump, $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max, 0.15% C grade from above prices, 1c for max, 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Carload, 31.5c; ton lots 33.5c; 250 to 1999 lb, 35.5c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4c per lb of alloy, carload packed, 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High - Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l., packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max. 0.025c C (simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%) Contract, c.l. 8 M x D, bulk, 26.25c per lb of contained Cr C.l., packed 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, iump, 4" x down and 2" x down, bulk, 25.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 25.90c per pound of contained chromium plus 12.60c per pound of contained silicon, F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 26-39%, Al 7-9%, C 0.05% max.) 25.75c per lb of contained chrome plus 12.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D; packed, max 0.50%, carload $1.12, ton lots $1.14, less ton $1.16. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max), $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.
75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe) C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%; Si 30-43%, Fe 40-45%, C 0.20% max.). Contract, c.l. lump bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c, F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y. freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3% lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.
(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 10,000 lb W or more, $4.35 per lb of contained W; 2000 lb W to 10,000 lb W, $4.45; less than 2000 lb W, $4.57, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $6.40 per lb of contained Cb, less ton $6.45. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe) Lump, carload, bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c; less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

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INTRODUCTION TO THE STUDY OF HEAT TREATMENT OF METALLURGICAL PRODUCTS

By Albert Portevin

Fundamental knowledge and essential principles of heat treatment of steel are presented in simple and understandable manner. Research engineers, metallurgical students and steel plant metallurgists engaged in metallurgical investigations and the heat treatment of ferrous and non-ferrous metals will find this book of inestimable value.

246 pages — **4 tables**
69 illustrations — **Price $5.00 Postpaid**

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ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

ORES

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail or vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit del. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	22.00
North African hematites (spot)	24.00-26.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$55.00
Domestic scheelite, mine	63.00

Manganese Ore

Manganese, 48% nearby, $1.18-1.21 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 90-93c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00

Brazilian

44% 2.5:1 lump	nom. $32

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb. molybdenum content, mines	$1.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89.00; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lochhaven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $99.30; Salina, Pa., $104.55; Niles, O., $109; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $99.30; Hays, Pa., $105.10; Niles, O., $107; E. Chicago, Ind., Joliet, Rockdale, Ill., $109.70; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° F: Massillon, O., $178.50; Clearfield, Pa., $179.55; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $186.90.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $69.30; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $92.40; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $127; Johnstown, Pa., $127.30; Clearfield, Pa., $135; St. Louis, $138; Athens, Tex., $140.90.

Nozzles

Reesdale, Pa., $203.20; *Johnstown, Pa., $208.40; Clearfield, Pa., $219.45; St. Louis, $224.65; Athens, Tex., $225.20.

Runners

Reesdale, Pa., $158.20; Johnstown, Pa., $161.70; Clearfield, Pa., $168.60; St. Louis, $170.30; Athens, Tex., $174.40.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico Mo., $166.30; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $210.20; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $244.85; Danville, Ill., $247.85; Clearfield, Pa., $252.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-15.00
Connellsville, foundry	16.50-17.00
New River foundry	20.50
Wise county foundry	15.95
Wise county, furnace	15.20

Oven Foundry Coke

Kearney, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, del.	*26.00
Chicago ovens	24.50
Chicago, del.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, del.	28.12
Cincinnati, del.	25.85
Painesville, O., ovens	25.50
Cleveland, del.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	21.65
Cincinnati, del.	26.58
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis, del.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, del.	26.62
Detroit, ovens	25.50
Detroit, del.	26.50
Buffalo, del.	28.08
Flint, del.	28.23
Pontiac, del.	27.06
Saginaw, del.	28.58

*Or within $1.55 freight zone from works

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	36.00
Toluol, one deg.	30.00-33.00
Industrial xylol	30.00-33.50

Per ton, bulk, ovens

Sulphate of ammonia	$44.45
Birmingham area	$49.50

Cents per pound, ovens

Phenol, 40 (carlots, nonreturnable drums)	17.25

FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $44; 70%, $42.50; 60%, $38.

Imported, net ton, duty paid, metallurgical grade, $35-$36.

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

GRAPHITE

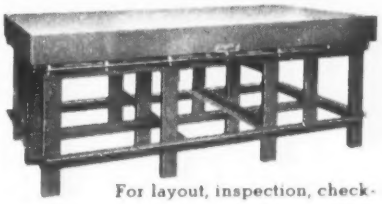
Diam. (Inches)	Length (Inches)	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95

CARBON

35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

where precision counts

Specify Challenge®



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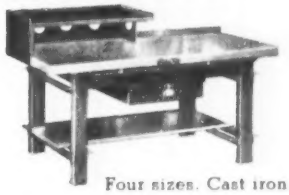
Challenge Work Benches . . .



Four sizes. Cast iron top, two inches thick. Welded steel supports, tool box shelf, steel drawer with lock.

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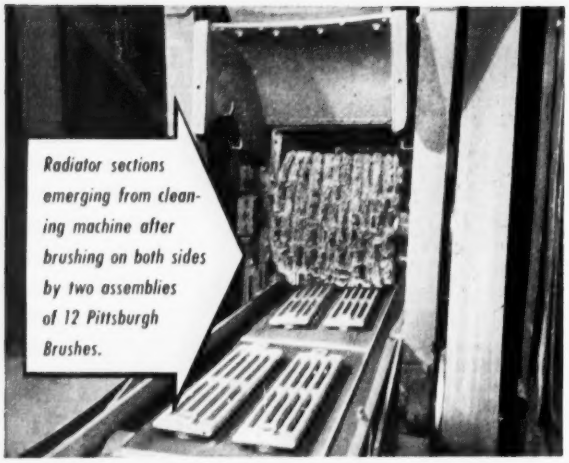

Radiator sections emerging from cleaning machine after brushing on both sides by two assemblies of 12 Pittsburgh Brushes.

Pittsburgh Brushes can help you solve problems like these!

Cleaning Narrow Spaces—National Radiator Company, Johnstown, Pa., cleans 30,000 radiator sections a week! To insure a perfect final finish, even the narrowest spaces must be absolutely clean prior to assembly. Pittsburgh engineers were asked to design a brush that would reach these spaces and would fit National's existing machine. Successful? National reports: "Pittsburgh Brushes do a better job of cleaning and are more economical!"

Preparing Chills—At Continental Foundry & Machine Co., East Chicago, Indiana, chills used to cast iron rolls must be cleaned of the oxidized metal remaining from previous usage, as well as dirt and grease accumulated in storage. After experimenting with other brushes, Continental chose Pittsburgh because they "do the job better and stand up longer than any previously used!"

Improving Original Equipment—The Sommer and Maca Glass Machinery Co., Chicago, Illinois, uses Pittsburgh Brushes in the automatic washing machines they manufacture. Brushes formerly used simply didn't have the over-all density pattern needed. Pittsburgh engineers studied the problem and designed a brush which Sommer and Maca approved "because of (its) denser bristle pattern and lower cost."

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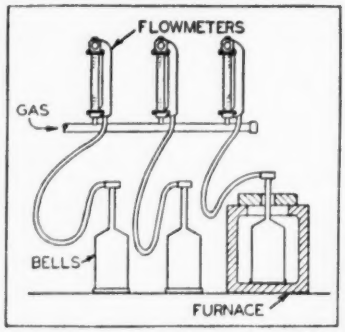
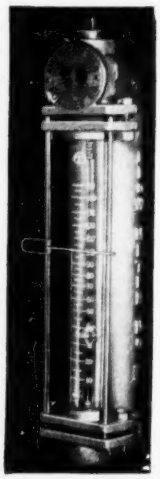
IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED



The above diagram shows the principle of operation of AGF FLOW METERS.

MEASURE YOUR GAS FLOW TO RETORT OR MUFFLE



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For Ni-Carbing* and Gas Carburizing in rotary and vertical retort carburizers, these meters permit maintenance and duplication of atmosphere gas flows.

* The Original Ammonia-Gas Case Hardening Process.

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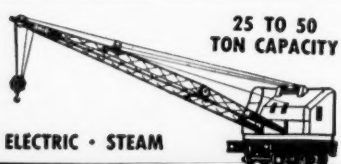

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ALL INDUSTRIAL USES
ARCHITECTURAL GRILLES
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DIAMOND MFG. CO.
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Tubular Goods . . .

Tubular Goods Prices, Page 161

Pittsburgh—Demand for pipe and tubing is becoming spotty, with the auto industry curtailing orders. While military requirements continue as strong as in the first half of the year, agricultural equipment makers are buying fewer tubes.

The small, "spot" order is taking the place of the large buying program, tubemakers report. This results in stepped-up sales campaigns. Some slowness in ordering is due to inventory checks, while warehouses here are buying mechanical tubing to round out their inventories.

Semifinished Steel . . .

Semifinished Prices, Page 158

Chicago—Steelmaking operations were scheduled at 102 per cent of capacity here last week, up 12 points over the revised rate of 90 per cent for the preceding week.

Hot weather and repairs to steelmaking equipment combined to limit production in the week ended Aug. 1 to a figure less than contemplated. U. S. Steel Corp. scheduled restart of its No. 3 open-hearth and bessemer shop at South Works for the night of Aug. 4. It had been down about 10 days for repairs to the three tilting open hearths and three bessemers.

Pig Iron . . .

Pig Iron Prices, Page 154

Cleveland—Interlake Iron Corp.'s production of pig iron during the first six months of 1953 totaled 601,560 gross tons, 20 per cent above output of last year's strike-afflicted first half.

Production in the first half of 1953 was reduced, however, by the loss of 127 furnace days in connection with installation of new blast furnaces at Erie, Pa., and Chicago. The company will continue to lose production of one furnace at Chicago until late in August when the new 850-gross-ton furnace is scheduled to go into operation.

The company's 700-gross-ton furnace at Erie has shown excellent results since it went into operation Mar. 4. At the company's Toledo, O., plant, the new battery of 57 coke ovens is now being heated and the first coke production is scheduled for the middle of August.

Summer slack in demand continues to be felt by merchant pig iron sellers here with vacations at foundries still a factor in the market. Expectations are pressure for deliveries will improve as the vacation season wanes but with a slowing down in the automotive industry anticipated in fourth quarter it is believed demand will not be as robust as it has been in recent months.

Automotive castings requirements have provided a strong suport to the merchant iron market this year and any letdown in demand from that direction would be keenly felt. Meanwhile, the furnaces are disposing of all their output but they are soliciting orders more energetically than for a long time past.

Buffalo—It is difficult to determine the current status of the merchant pig iron market. Slackening in demand may be due to either general market conditions or vacation periods among consumers. Demand from ingot producers is sustained. One of the two idle blast furnaces in this area is expected to be relighted shortly.

Philadelphia—The smaller of the two stacks at Swedeland, Pa., was forced out of action several days ago and will be down for 6 to 8 weeks for relining. Operators originally had planned to blow out the stack around Sept. 1.

No shortage of iron is anticipated in this district this summer. Consumption is down seasonally and consumer inventories are in fair shape. Moreover, an increasing amount of foreign iron is being offered at prices that are proving attractive to some buyers. Recent purchasers include two soil pipemakers who bought Sewdish high phos iron. A shipment of Spanish iron recently arrived here and another shipment is on the way.

Pittsburgh—This district's seasonally slack period is expected to continue for several weeks. "At best, demand is spotty," one source states. Vacation shutdowns of foundries, added to continued operation of blast furnaces, produces a continuing surplus of pig iron.

The Pittsburgh area's number of blast furnaces dropped to 54 last week when U. S. Steel Corp. closed its two Isabella furnaces at Etna, Pa. One was blown out on July 28 and the other on July 30. Obsolescence was the main reason for closing the stacks.

Cincinnati—Vacations are still interfering with the movement of pig iron. Most foundries have low inventories which indicate they will begin ordering this month. Even though automotive foundries are scheduled to Labor Day and the machine tool foundries have some backlogs, it appears most foundries will be feeling their way through August and September.

Birmingham—A generally soft market for pig iron has firmed somewhat with completion of vacation

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schedules by most of the district's pipe plants. One merchant iron seller said it expects a return to "normal" demand by end of the current month.

Iron Ore . . .

Iron Ore Prices, Page 179

Cleveland—July shipments of iron ore on the Great Lakes set a new monthly record, according to data just issued by the Lake Superior Iron Ore Association. Movement of ore from upper lake ports during the month totaled 14,496,711 gross tons, an increase of 12,593,039 tons over shipments in July last year when shipping was idled by the steel strike. The previous record monthly movement was in September last year when shipments totaled 14,388,625 gross tons.

Shipments in July brought the season movement for the year to Aug. 1 to 50,555,082 gross tons, comparing with 23,419,776 tons in the like period of 1952.

The 1953 season still has four months to go and with ore coming down to lower lake ports in record weekly volume there is every expectation that the season total movement will exceed 100 million tons by a comfortable margin. This will surpass the record movement of 92,076,781 tons set in 1942 by a wide margin.

Weekly shipments continue in heavy volume. In the week ended Aug. 3 shipments amounted to 3,226,655 tons.

During the last three years 30 new carriers have been added to the lakes ore fleet. Currently, two new carriers, the *Richard M. Marshall* and the *William C. Ford* are due to join the fleet this week.

Scrap . . .

Scrap Prices, Page 184

Chicago—Pressure for higher scrap prices appears to have been arrested by the recent acquisition by an important consumer. Prices established in that transaction continue to stand although brokers in some cases are paying more to fill orders.

Perhaps the strongest influence in holding down prices is the generous inventories of all steel mills and the fact that additional material is bought sparingly. One mill declines to buy No. 2 bundles, and furthermore, is limiting the tonnage delivered daily. Blast furnace grades show a little additional strength.

Boston—Cast scrap continues slack and weak. Most foundries have sufficient reserves to carry on at the current rate of melt and when buying small shipments refuse better bids. All cast grades are in a buyers' market. No. 2 heavy melting steel has firmed and is near the normal differential with No. 1 steel. All turnings grades are also stronger.

New York—Steel scrap grades are slightly more active, releases against old orders are coming in and some new buying is noted. Spread between the two heavy melting grades continues at $6, No. 2 not following the advance in No. 1 heavy melting. Poor preparation is one reason advanced. The volume of scrap reaching yards is limited. Cast grades are moving slowly.

Buffalo—Steady to slightly easier tendencies rule in the scrap market here. Prices are unchanged as the mills delay placing new orders pending clearance of business still on books. Dealers' yard receipts are light but easement in some lines of industry, plus possible tapering off in military work, are bearish factors. The cast market is weak with buying interest negligible.

Philadelphia—The scrap market here is on a fairly even keel. Movement is steady and most mills are in comfortable inventory position on

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the basis of present receipts. Some mills are willing and able to build up inventories a bit. Prices are steady.

Pittsburgh—Demand remains firm for better grades of scrap although the market is generally slow. Buying by electric furnace operators keeps No. 1 heavy melting steady, but several trade interests expect a decline in prices within 30 to 60 days. Active buying, it is said, would establish a definite price on No. 1 bundles.

Cleveland — The scrap market in this district is marking time with new buying reduced to a trickle. Heavy tonnage is moving to the mills on old contracts, however, dealers shipping material out of their yards as quickly as possible.

Prices are unchanged at levels recently established but the feeling persists that some downward adjustments are likely soon unless demand pressure revives. This pessimistic view among dealers and brokers is offset to some extent by the fact railroad scrap lists went at higher prices last week, a development which is seen as pointing to continued heavy consumption by the mills through fourth quarter. However, railroad scrap contracts extend for only 60 days and substantial unshipped tonnage after that period might be subject to cancellation in event of a downturn in consuming requirements.

Cincinnati—All open-hearth scrap declined $1 last week with the exception of No. 2 heavy melting which held firm at $40 a ton. Borings and turnings took a turn toward fluidity with machine shop turnings taking a nominal price of $19 a ton—a drop of $4 from its previous level. Mixed borings and turnings and cast iron borings declined $2 each while short shovel turnings took a $1 to $2 a ton drop.

Prices declined simply because mills reduced their melting requirements in August after heavy buying in July.

Detroit—Automotive scrap lists closed at higher prices on most items than in many months indicating to some market observers that reciprocal deals between mills and customers may be under way. Prices reportedly ran as high as $43 on No. 1 bundles in some cases while the open market price is $40 to $41.

Birmingham—Demand for most grades of scrap remains slow. Some heavy melting is moving, mostly to other steel producing areas.

Los Angeles—Demand for scrap continues weak. Foundries are mostly in the midst of vacations and little scrap is moving to them.

San Francisco—Ample scrap is available and it is being sold in a routine manner with no indications dealers are stocking it for sale later at a possibly higher price.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 179

Denver, Colo. — The volume of chemical by-products produced by the Colorado Fuel & Iron Corp. at its Pueblo, Colo., works has greatly increased, reflecting expanded coke production in line with mounting blast furnace requirements.

Around 10,000 gallons of benzol are produced daily at Pueblo's by-product coke plant. Other chemicals produced in quantity include tar, ammonium, toluol and xylol.

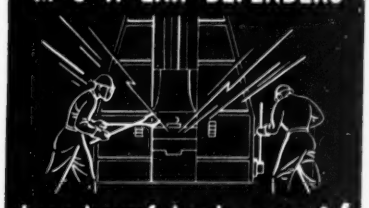
Raw Materials Use Large

New York—Despite the two-month strike that drastically reduced steelmaking operations in 1952, the industry consumed record amounts of natural gas, nickel, cobalt and boron during the year, according to the American Iron & Steel Institute.

Actually, reports the Institute, the strike helped to increase the industry's use of natural gas, a large volume of which was burned to keep idle furnaces warm enough to avoid costly damage. The total amount of natural gas used was nearly 209 billion cubic

(*Please Turn to Page* 186)

M·S·A EAR DEFENDERS



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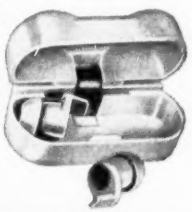

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THE CLEVELAND VIBRATOR COMPANY

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IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commissions, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Aug. 6	$44.08
July 30	44.08*
July avg.	43.51
Aug. 1952	43.00
Aug. 1948	43.33

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania. *Revised

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting	44.00-45.00
No. 2 heavy melting	43.00-44.00
No. 1 bundles	44.00-45.00
No. 2 bundles	41.00-42.00
No. 1 busheling	44.00-45.00
Machine shop turnings	27.00-28.00
Mixed borings, turnings	30.00-31.00
Short shovel turnings	31.00-32.00
Cast iron borings	30.00-31.00
Cut structurals	48.00-49.00
Heavy turnings	41.00-42.00
Punchings & plate scrap	49.00-50.00
Electric furnace bundles	48.00-49.00

Cast Iron Grades

No. 1 cupola	43.00-44.00
Charging box cast	42.00-43.00
Heavy breakable cast	40.00-41.00
Unstripped motor block	35.00-36.00
No. 1 machinery cast	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt.	46.00-47.00
Rails, 2-ft. and under	53.00-54.00
Rails, 18-in. and under	54.00-55.00
Rails, random lengths	49.00-50.00
Rails specialties	51.50-52.50

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	45.00-46.00
No. 2 heavy melting	41.00-42.00
No. 1 bundles	45.00-46.00
No. 2 bundles	39.00-40.00
No. 1 busheling	45.00-46.00
Machine shop turnings	24.00-25.00
Mixed borings, turnings	28.00-29.00
Short shovel turnings	28.00-29.00
Cast iron borings	28.00-29.00
Low phos.	46.00-47.00
Alloy free, short shovel turnings	31.00-32.00
Electric furnace bundles	45.00-46.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Charging box cast	44.00-45.00
Stove plate	43.00-44.00
Heavy breakable cast	38.00-39.00
Unstripped motor blocks	27.00-28.00
Brake shoes	38.00-39.00
Clean auto cast	46.00-47.00
No. 1 wheels	40.00-41.00
Burnt cast	35.00-36.00
Drop broken machinery	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt.	46.00-47.00
R.R. Malleable	*50.00-51.00*
Rails, 3-ft. and under	52.00-53.00
Rails, 18 in. and under	55.50-56.50
Rails, random lengths	48.50-49.50
Cast steel	50.00-51.00
Railroad specialties	52.00-53.00
Uncut tires	51.00-52.00
Angles, splice bars	*53.00-54.00*
Rails, rerolling	55.00-56.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	45.00-46.00
No. 2 heavy melting	42.00-43.00
No. 1 bundles	45.00-46.00
No. 2 bundles	40.00-41.00
Machine shop turnings	26.00-27.00
Short shovel turnings	31.00-32.00
Cast iron borings	31.00-32.00
Low phos.	48.00-49.00
Electric furnace bundles	48.00-49.00

Railroad Scrap

No. 1 R.R. heavy melt.	48.00-49.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	44.00-44.50
No. 2 heavy melting	39.00-39.50
No. 1 bundles	44.00-44.50
No. 2 bundles	35.50-36.50
No. 1 busheling	44.00-44.50
Electric furnace bundles	44.50-45.50
Machine shop turnings	28.00
Mixed borings, turnings	32.00
Short shovel turnings	34.00
Structurals & Plate	46.00-47.00
Heavy turnings	42.00-43.00
Couplers, springs, wheels	50.00-51.00

Cast Iron Grades

No. 1 cupola	38.00-39.00
Charging box cast	40.00
Heavy breakable cast	43.00
Unstripped motor blocks	32.00
Drop broken machinery	47.00-48.00

NEW YORK

(Brokers' Buying Prices)

No. 1 heavy melting	37.00-37.50
No. 2 heavy melting	31.00-32.00
No. 1 bundles	*37.00-38.00*
No. 2 bundles	29.00-29.50
Machine shop turnings	*19.00-19.50*
Mixed borings, short turnings	22.00-23.00
Low phos. (structural & plate)	*38.00-39.00*
Shovel turnings	23.00-24.00

Cast Iron Grades

No. 1 cupola	33.00-34.00
Unstripped motor blocks	25.00-26.00

DETROIT

No. 1 heavy melting	*37.50-38.50*
No. 2 heavy melting	33.00-34.00
No. 1 bundles	40.00-41.00
No. 2 bundles	31.00-32.00
No. 1 busheling	35.00-36.00
Machine shop turnings	19.00-20.00
Mixed borings, turnings	*21.00-22.00*
Short shovel turnings	22.00-23.00
Punchings & Plate scrap	*39.00-40.00*

Cast Iron Grades

No. 1 cupola	43.00
Changing box cast	34.00-35.00
Stove plate	34.00-35.00
Heavy breakable	29.00-30.00
Unstripped motor blocks	30.00
Clean auto cast	42.00-43.00
Malleable	44.00

CINCINNATI

(Brokers' Buying Prices)

No. 1 Heavy melting	*43.00*
No. 2 heavy melting	40.00
No. 1 bundles	*43.00*
No. 2 bundles	*37.00*
No. 1 busheling	*43.00*
Machine shop turnings	*19.00**
Mixed borings, turnings	*23.00**
Short shovel turnings	*23.00-24.00**
Cast iron borings	*23.00**

Cast Iron Grades

No. 1 cupola	45.00
Charging box cast	40.00
Heavy breakable cast	40.00
Drop broken machinery	50.00

Railroad Scrap

No. 1 R.R. heavy melt.	46.00
Malleable	47.00
Rails, 18-in. and under	55.00
Rails, random lengths	48.00

*F.o.b. shipping point.

CHICAGO

No. 1 heavy melting	43.00-44.00
No. 2 heavy melting	39.00-40.00
No. 1 factory bundles	44.00-45.00
No. 1 dealer bundles	43.00-44.00
No. 2 bundles	36.00-37.00
No. 1 busheling	43.00-44.00
Machine shop turnings	*22.00-24.00*
Mixed borings, turnings	*24.00-26.00*
Short shovel turnings	*24.00-26.00*
Cast iron borings	*24.00-26.00*
Cut structurals, 3-ft.	*47.00-48.00*
Punchings & plate scrap	*47.00-48.00*
Electric furnace bundles	*45.00-46.00*

Cast Iron Grades

No. 1 cupola	*41.00-43.00*
Stove plate	35.00-37.00
Unstripped motor blocks	35.00-37.00
Clean auto cast	45.00-47.00
Drop broken machinery	45.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt	46.00-47.00
R.R. Malleable	43.00-45.00
Rails, 2-ft. and under	*55.00-56.00*
Rails, 18-in. and under	*57.00-58.00*
Angles, splice bars	51.00-52.00
Rails, rerolling	*55.00-57.00*

BIRMINGHAM

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	27.00-28.00
No. 1 bundles	29.50-30.50
No. 2 bundles	29.00-30.00
Machine shop turnings	20.75-21.75
Short shovel turnings	22.75-23.75
Cast iron borings	22.75-23.75
Cut structurals	39.00-40.00
Electric furnace bundles	32.00-33.00

Cast Iron Grades (F.o.b. Shipping Point)

No. 1 cupola	39.00-40.00
Charging box cast	30.00-31.00
Stove plate	35.00-36.00
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	34.00-35.00
No. 1 wheels	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00
Rails, 2-ft and under	45.00-46.00
Rails, random lengths	42.00-43.00
Angles, splice bars	45.00-46.00
Rails, rerolling	45.00-46.00

ST. LOUIS

(Brokers' Buying Prices)

No. 1 heavy melting	41.00-42.00
No. 2 heavy melting	36.00-38.00
No. 1 bundles	39.00-40.00
No. 2 bundles	34.00-36.00
Machine shop turnings	19.00-20.00
Short shovel turnings	21.00-22.00

Cast Iron Grades

No. 1 cupola	41.00-42.00
Charging box cast	35.00-36.00
Heavy breakable cast	36.00-38.00
Unstripped motor blocks	35.00-36.00
Brake shoes	41.00
Clean auto cast	44.00
Burnt cast	34.00-35.00

Railroad Scrap

Malleable	36.00
Rails, 18-in. and under	53.00-55.00
Rails, random lengths	48.00-50.00
Uncut tires	46.00
Angles, splice bars	46.00-47.00
Rails, rerolling	51.00-53.00

BUFFALO

No. 1 heavy melting	43.50-44.00
No. 2 heavy melting	40.00-40.50
No. 2 bundles	38.00-38.50
No. 1 bundles	43.50-44.50
No. 1 busheling	43.50-44.50
Machine shop turnings	26.00-27.00
Mixed borings, turnings	31.50-32.00
Short shovel turnings	31.50-32.00
Cast iron borings	31.50-32.00
Low phos.	47.50-48.00

Cast Iron Grades (F.o.b. Shipping Point)

No. 1 cupola	40.00-41.00
No. 1 machinery	44.00-45.00

Railroad Scrap

Rails, random lengths	48.50-49.00
Rails, 2 ft and under	53.50-54.00

BOSTON

(Brokers' Buying Prices; f.o.b. shipping points)

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	30.00-31.00
No. 1 bundles	33.00-34.00
No. 2 bundles	28.00-29.00
Machine shop turnings	18.50-19.00
Mixed borings, turnings	21.00-22.00
Short shovel turnings	22.00-23.00
No. 1 cast	30.00-31.00
Mixed cupola cast	26.00-28.00
No. 1 machinery cast	38.00-39.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	31.00
No. 2 heavy melting	27.00
No. 1 bundles	29.00
No. 2 bundles	23.00
No. 3 bundles	19.00
Machine shop turnings	13.00
Mixed borings, turnings	13.00
Short shovel turnings	13.00
Electric Furnace, No. 1	38.00-40.00

Cast Iron Grades (F.o.b. Shipping Point)

No. 1 cupola	30.00-35.00
Heavy breakable cast	30.00-35.00
Unstripped motor blocks	27.00
No. 1 wheels	38.00-40.00
Stove plate	26.00

Railroad Scrap

Rails, random lengths	34.00-35.00

SAN FRANCISCO

No. 1 heavy melting	28.00
No. 2 heavy melting	24.00
No. 1 bundles	25.00
No. 2 bundles	22.00
No. 1 busheling	28.00
Machine shop turnings	10.00
Mixed borings, turnings	29.00
Short shovel turnings	29.00
Cast iron borings	29.00
Cut structurals	38.00
Heavy turnings	34.00
Punchings & plate scrap	37.50
Electric furnace bundles	37.00

Cast Iron Grades

No. 1 cupola	39.00
Charging box cast	47.00
Stove plate	46.00
Heavy breakable cast	45.00
Unstripped motor blocks	41.00
Brake shoes	41.00
Clean auto cast	52.00
No. 1 wheels	47.00
Burnt cast	41.00
Drop broken machinery	52.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00
Malleable	55.00
Rails, 3-ft and under	42.00
Rails, 18-in. and under	45.00
Rails, random lengths	39.00
Cast steel	40.00
Uncut tires	39.00
Angles, splice bars	42.00
Rails, rerolling	44.00

LOS ANGELES

No. 1 heavy melting	24.00
No. 2 heavy melting	20.00
No. 1 bundles	23.00
No. 2 bundles	20.00
Machine shop turnings	8.00

Cast Iron Grades (F.o.b. Shipping Point)

No. 1 cupola	37.00-40.00

HAMILTON, ONT.

(Delivered Prices)

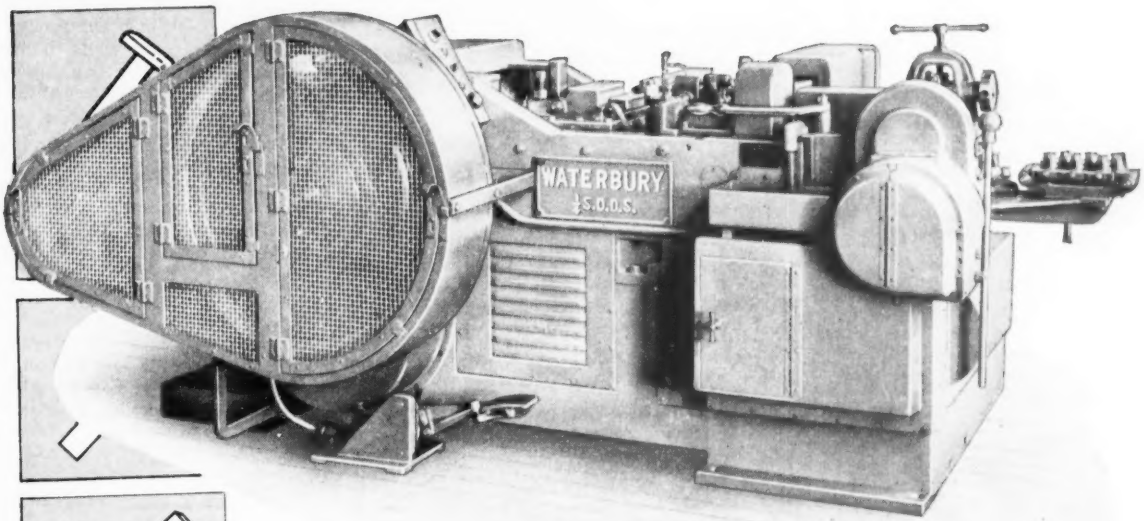
Heavy melting	$32.50
No. 1 bundles	32.50
No. 2 bundles	32.50
Mechanical bundles	28.50
Mixed steel scrap	28.50
Mixed borings, turnings	26.50
Rails, remelting	32.50
Rails, rerolling	41.50
Busheling	26.50
Busheling new factory:	
Prep'd	30.50
Unprep'd	28.50
Short steel turnings	22.50

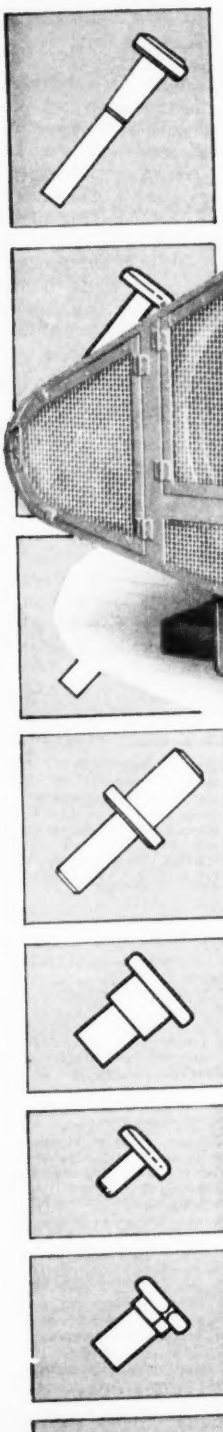
Cast Iron Grades

No. 1 machinery cast	46.00-50.00

† F.o.b., shipping point.

HERE'S THE WATERBURY SOLID DIE DOUBLE STROKE HEADER





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For further information, write, wire or phone —

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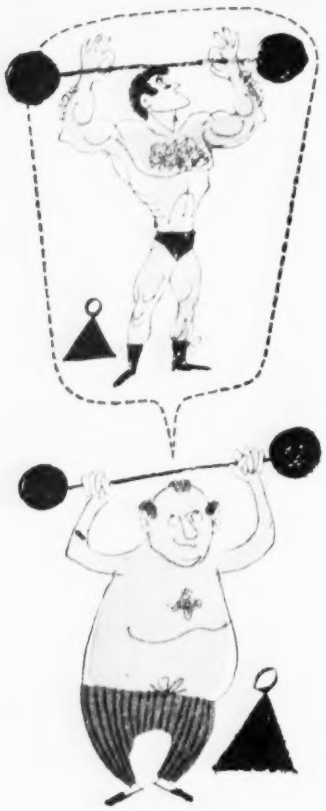
WATERBURY 20, CONN.
Sales Offices: Chicago, Cleveland, Millburn, N. J.

A FEW OF THE MANY TYPES OF METAL WORKING MACHINERY MADE BY WATERBURY FARREL

COLD PROCESS BOLT AND NUT MACHINERY — Headers (all types) · Rivet Machinery · Trimmers · Thread Rolling Machines · Slotters · Nut Formers and Tappers, etc. POWER PRESSES — Crank, Cam and Toggle; also Rack and Pinion Presses · Eyelet Machines · Multiple Plunger Presses · Horizontal and Hydraulic Presses, etc. MILL MACHINERY — Rolling Mills: Strip, Rod, Wire Flattening (For Ferrous and Non Ferrous Metals) · Also Slitters · Straighteners · Cut-off Saws · Coilers · Winders, etc. WIRE MILL EQUIPMENT — Continuous Wire Drawing Machines (Upright Cone and Tandem) · Wire Flattening Mills · Chain Draw Benches · Pointers · Swagers · Bull Blocks · String-up Machines · Spoolers, etc.



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Torrington Swaging Machines taper both tubular and solid work quickly, accurately and economically. Delivering 4000 hammer blows a minute, the swager gives the metal toughness and resiliency . . . utilizes all the stock.

Our booklet, "The Torrington Swaging Machine," describes the art of swaging and illustrates the complete line of Torrington Swagers. Write for your free copy . . . today!

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Swager Department
556 Field Street • Torrington, Conn.
Makers of
TORRINGTON NEEDLE BEARINGS

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feet, enough to meet the requirements of Illinois last year.

Consumption of nickel, cobalt and boron as alloying elements set new records. Use of nickel increased by nearly 9 million pounds over that the previous year, reaching a total of nearly 85 million pounds. Cobalt consumption was record-breaking at 2.6 million pounds. Use of boron increased 65 per cent over the previous year to 49,000 pounds, while production of steel containing the element nearly doubled, reaching 703,000 tons.

Use of iron ore during the year amounted to 112.5 million net tons. Coal consumption decreased from 100 to 87 million tons, and consumption of coke totaled 59 million tons. Total use of scrap was the third largest on record at a little more than 53 million tons.

About 2,250,000,000 gallons of fuel oil and 262 million gallons of tar and pitch were burned in the steel industry's furnaces in 1950. Use of electric power was nearly 26 billion kilowatt hours, and consumption of fluxes was 33,250,000 tons.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1480 tons, power house, New York State Electric & Gas Co., Binghamton, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.

560 tons, chemical plant, Deer Park, Tex., for Roehm & Haas Co., Philadelphia, to unnamed fabricator.

101 tons, state bridge, Tioga county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.

STRUCTURAL STEEL PENDING

6000 tons, bakery, Roosevelt boulevard, Philadelphia, for National Biscuit Co., New York, bids asked.

6000 tons, Pennsylvania railroad shops, Hollidaysburg, Pa., to be redesigned and readvertised.

3800 tons, state bridgework, Philadelphia and Montgomery counties, Pennsylvania; Pennsylvania Conduit & Foundation Co., Philadelphia, low on general contract.

1500 tons, plant extension, Red Lion plant, Budd Co., Philadelphia, pending.

1115 tons, underpass, railroad tracks, East Capitol street, encased beam superstructure, Washington, D. C.; bids Aug. 16, director of highways, district government; also 260 tons of reinforcing steel.

1100 tons, underpass, Bureau of Public Works, Washington, D. C., bids Aug. 26.

535 tons, two bridges, I-beams on bearing piles, New Castle-Portsmouth, N. H.; bids Aug. 13, Concord, N. H.; also 225 tons bearing piles, 65 tons reinforcing steel and 6085 square feet open steel grid flooring.

300 tons, boiler house, Pennsylvania railroad shops, Altoona, Pa.; bids Aug. 10.

270 tons, three rolled span beam bridges, each 50-ft., Windsor, Conn.; bids in; also 140 tons concrete reinforcing deformed bars.

240 tons, state bridge, Westmoreland county, Pennsylvania, Latrobe Road Construction Co., low on general contract.

238 tons, state bridge, Mercer county, New Jersey, bids Aug. 18.

200 tons, high school, Dunkannon, Pa., bids Aug. 20.

160 tons, plant addition, Lansdale Tube Co., Lansdale, Pa., pending.

REINFORCING BARS . . .

REINFORCING BARS PENDING

630 tons, West Virginia turnpike, near Ghent and Lively, W. Va.; bids in.

RAILROAD EQUIPMENT—*FOR SALE*

USED **AS IS** **RECONDITIONED**

STANDARD GAUGE FREIGHT CARS

Box, Steel Sheathed, 40-Ton Capacity

Box, Double Sheathed, 50-Ton Capacity

Box, Single Sheathed, 50-Ton Capacity

Flat, 50-Ton, Steel Underframe, 40'6" Long

Gondolas, Composite, or All Steel 50-Ton and 70-Ton

Hoppers, Twin, All-Steel, 50-Ton, Cross Dump

Ore Hoppers, All-Steel, 50-Ton, Heavy Duty

Tank, 3,000-Gallon, High Pressure

Tank, 8,000-Gallon, Coiled and Non-Coiled

Hoppers, All Steel, 70-ton, Triple Hopper Cross Dump

EXTRA LONG FLAT CARS

40 & 50-Ton Capacity, Length 70' and 74'
70-Ton Capacity, Length 60'0", All-Steel, Fishbelly Underframes

STANDARD GAUGE AIR DUMP CARS

Side Dump, 20-Yd., 40-Ton, Lift Door
End Dump, 20-Yd., 50 Ton, Drop Door
Side Dump, 30-YD., 50-TON, DROP DOOR

CABOOSE CARS

Eight Wheel, Cupola Type

OTHER EQUIPMENT

Jordan Spreader
Locomotive Cranes
Overhead Cranes
Railroad Track Scales

STANDARD GAUGE DIESEL-ELECTRIC ROAD SWITCHING LOCOMOTIVE

300 H.P., 70-Ton, Type 0-4-4-0
NEW AND RELAYING RAIL

Send us your inquiries ***WE BUY FREIGHT CARS FOR DISMANTLING*** ***Send us your offerings***

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New York 7, N. Y.
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STORAGE TANKS
6,000 Gallon
8,000 Gallon
10,000 Gallon

"ANYTHING containing IRON or STEEL"

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Accounts Wanted

REPRESENTATION WANTED
Small firm which has succeeded in establishing one company's products in the steel industry on a wide, permanent and profitable basis can now provide aggressive representation for one or two other lines. Reply Box 785, STEEL, Penton Bldg., Cleveland 13, Ohio.

Help Wanted

A MAN EXPERIENCED IN ELECTRICAL MAINTENANCE WORK, preferably one with modern electrification practice where utilized in blast furnace operations, such as, charging control and power generation. Write stating salary expected. Reply Box 781, STEEL, Penton Bldg., Cleveland 13, Ohio.

SALESMAN
Graphite refractories to nonferrous foundries and steel mills New England and New York City; straight commission; experienced; practical background desirable; write giving full details and references. Address Box 792, STEEL, Penton Bldg., Cleveland 13, Ohio.

Positions Wanted

PLANT MANAGER with 25 years' experience in Costs, Production and Management functions, M.I.T. graduate. Write Box 758, STEEL, Penton Bldg., Cleveland 13, Ohio.

GENERAL MANAGER
14 years' warehouse experience, national distribution and export, age 39, broad background sales and metallurgy. Reply Box 782, STEEL, Penton Bldg., Cleveland 13, Ohio.

PLANT MANAGER 20 years' experience in Plant Management, Production Control, Manufacturing Development. Could invest. Age 45, married, family. Reply Box 783, STEEL, Penton Bldg., Cleveland 13, Ohio.

EXECUTIVE PURCHASING AGENT. 28 YEARS EXPERIENCE. UNIVERSITY EDUCATION. WILL FURNISH A-1 REFERENCES. TECHNICAL BACKGROUND. WRITE BOX 794, STEEL, PENTON BLDG., CLEVELAND 13, OHIO

DEAERATOR TANKS

19 Cold water deaerators, rubber lined, never used, 3,000 gal. per minute. Tanks are 11' by 55' built for pressure and vacuum, price $11,000, F.O.B. cars.

GEORGE R. MARVIN COMPANY
1601 Taylor Way Tacoma, Washington
BR 2207

WANTED
USED SCREW MACHINE.
'42 model or later, in good condition. Six spindle Model 60 New Britain Gridley one-inch capacity with threading attachment.
Write or wire W. R. Nordberg,
Rival Mfg. Co., Kansas City, Mo.

WANTED
Salesmen or sales agents, on commission arrangement, for Eastern Seaboard and Midwest—to sell quantity lots of small and medium size gray iron castings for well equipped highly mechanized production foundry with machining facilities in the Metropolitan New York area. Reply Box 778, STEEL, 60 East 42nd Street, New York 17, N. Y.

MANUFACTURERS REPRESENTATIVE
Sales Engineer with large following in Southern Ohio and Indiana desires one additional line to be carried to appliance manufacturers in this area. Can produce best results for a product that requires technical sales presentation to both engineers and buyers. Write Box 793, STEEL, Penton Bldg., Cleveland 13, Ohio.

FOUNDRY EQUIPMENT SALES ENGINEER

Man with good background in foundry operations or foundry engineering for equipment sales in excellent territory. Prefer minimum two years engineering education. Must be willing to travel. Salary, commissions and expenses. Write resume of qualifications to

Box 780, STEEL
Penton Building **Cleveland 13, Ohio**

NEW **PIPE** Warehouse Stocks of STANDARD • MERCHANT LAP WELD • SEAMLESS BUTTWELD • SPIRAL WELD
L.B. FOSTER Co.
HOUSTON 2, TEX. CHICAGO 4, ILL.
PITTSBURGH 30, PA. NEW YORK 7, N.Y.

FABRICATING

Fabricating, welding and machine shop has open time on following equipment:

G & L 5" bar table type Boring Mill
Sellers 5" bar table type Boring Mill with rotary table
Lucas 5" bar table type Boring Mill with rotary table
Sellers 6" bar floor type Boring Mill with 16 ft x 20 ft table
6 heavy duty Radial Drills
4 heavy duty Milling Machines
1 Planer
3 heavy duty Lathes and a fine complement of other precision machine tools

Fabricating equipment consists of:

3 large press brakes
4 medium sized brakes
also mechanical presses up to 750-ton capacity

Have open welding time on both mild steel, stainless steel, aluminum and other non-ferrous alloys.

Plant has 250,000 sq ft of floor space which is serviced by 18 cranes up to 20 ton capacity.

Shop Personnel are highly skilled mechanics who have been in our employ 5 years and over. We have a highly skilled engineering department experienced in the design of special tool dies, jigs and fixtures.

All inquiries will be given immediate attention.

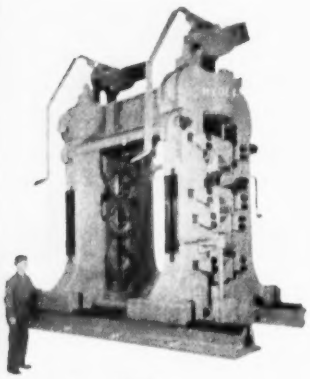
Address Box 790, STEEL
Penton Building **Cleveland 13, Ohio**

Hyde Park

RED CIRCLE Rolls ALLOY-CHILLED

Rolling Mill Equipment

Outstanding in quality and in performance Hyde Park Rolling Mill Equipment has enjoyed the respect of the industry for more than fifty years.



Bar Mills
Merchant Mills
Sheet and Strip Mills
Pinion Stands
Roller Tables
Reduction Drives
Stretcher Levellers
Guillotine Shears
Sheet Mill Shears
Roll Lathes
Special Machinery
Machine Work

Hyde Park

FOUNDRY & MACHINE CO.
Hyde Park, Westmoreland County, Pa.

ROLLS
ROLLING MILL MACHINERY
GREY IRON CASTINGS

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HERE YOU SEE two old Clevelands on coal conveyor lines in the main city water works pumping station in Cleveland, Ohio. For 38 years these worm gear speed reducers have worked steadily with never a breakdown.

WORM GEARING—universal in its application—affords advantages for almost every power transmission job. Whether you want worm gearing sets or speed reducer units, you will find drives to meet your need in the complete Cleveland line.

CLEVELANDS give 38 years of continuous service

THESE two Cleveland veterans have been driving coal conveyors for 38 straight years—at least 6 hours each day. The place: City of Cleveland's Division Avenue Pumping Station.

Since 1915 these Cleveland worm gear speed reducers have moved nearly 2 million tons of coal and unnumbered tons of ashes. Each drive has outlasted two motors. They have survived several plant fires. Yet, there has been no major replacement of parts for either drive. Here's why:

Since 1912, Cleveland has concentrated its engineering know-how on the manufacture of one product—worm gearing. Case hardened steel worms, long wearing, low friction bronze gears, and rugged dust-proof and moisture-proof housings are designed and built to give year-after-year dependability under severest operating conditions.

Be sure you specify Cleveland when you want a long wearing right angle drive. Get further data by writing today for new Catalog 400. The Cleveland Worm and Gear Company, 3270 East 80th Street, Cleveland 4, Ohio.

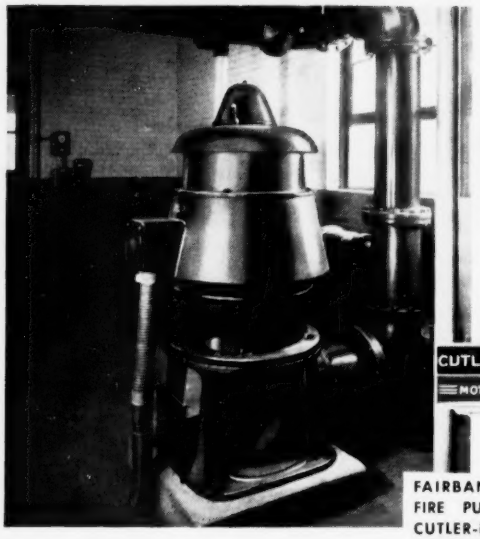
Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

CLEVELAND
Worm Gear
Speed Reducers

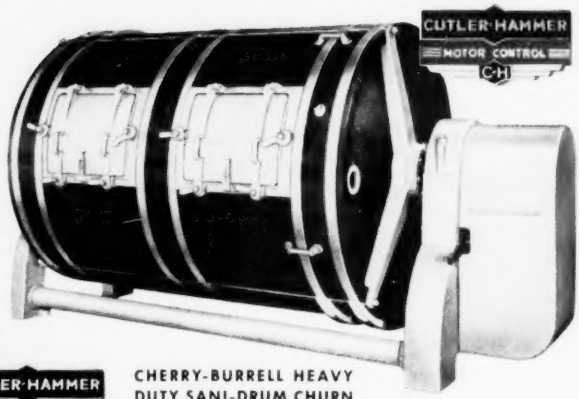
CUTLER-HAMMER
MOTOR CONTROL
C-H

Choice of the Leaders

The Mark of Better Machines

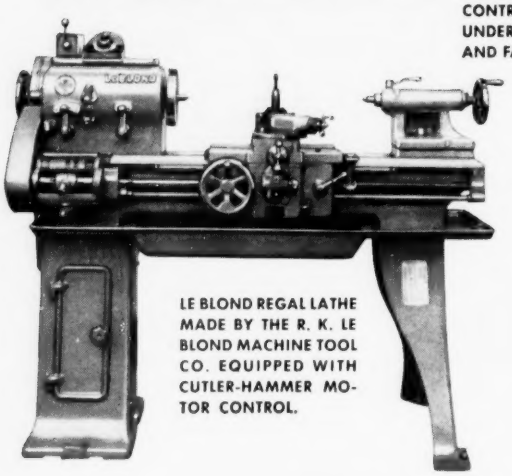


FAIRBANKS-MORSE TURBINE FIRE PUMP EQUIPPED WITH CUTLER-HAMMER FIRE PUMP CONTROL AS APPROVED BY THE UNDERWRITERS' LABORATORIES AND FACTORY MUTUAL.

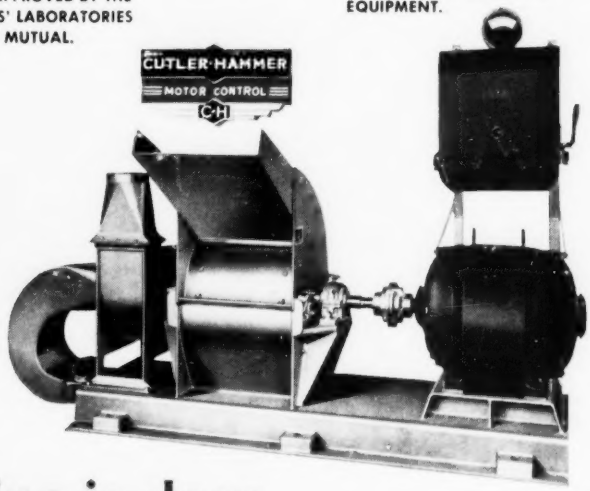


CHERRY-BURRELL HEAVY DUTY SANI-DRUM CHURN MADE BY CHERRY-BURRELL CORPORATION AND EQUIPPED WITH CUTLER-HAMMER MOTOR CONTROL.

HEIL MODEL 24-24 HAMMERMILL MADE BY THE HEIL CO. CUTLER-HAMMER MOTOR CONTROL IS FURNISHED AS STANDARD EQUIPMENT.



LE BLOND REGAL LATHE MADE BY THE R. K. LE BLOND MACHINE TOOL CO. EQUIPPED WITH CUTLER-HAMMER MOTOR CONTROL.



The meaning is clear

In the never-ending struggle for business, there are a few manufacturers in every field who fare extraordinarily well. These manufacturers become acknowledged leaders. Their products are widely accepted as the best. Their names become "buy-words" for assured satisfaction. To any thinking person, the meaning must be clear. These companies gain preferred position only because their products *merit* approval. And to *hold* this advantage these companies *must* follow a policy of scrupulous attention to every detail that influences product performance in the user's hands. One more conclusion is inescapable. That machinery manufacturers who win and hold leadership in their fields, so continuously and repeatedly select Cutler-Hammer Motor Control for their machines speaks volumes for the dependability of this control. The meaning for you could not be clearer. Cutler-Hammer Motor Control is a profitable choice for you as well. CUTLER-HAMMER, Inc., 1211 St. Paul Ave., Milwaukee 1, Wis. *Associate:* Canadian Cutler-Hammer, Ltd., Toronto, Ontario.